Telephony

THE AMERICAN TELEPHONE JOURNAL

PUBLISHED EVERY WEEK
BY TELEPHONY PUBLISHING CORP.
608 S. DEARBORN ST., CHICAGO, ILL.

AUGUST 9, 1924. [VOL. 87. NO. 6.]

Entered as second-class matter Sept. 4, 1903, at the post office at Chicago, Ill., under act of March 3, 1879.

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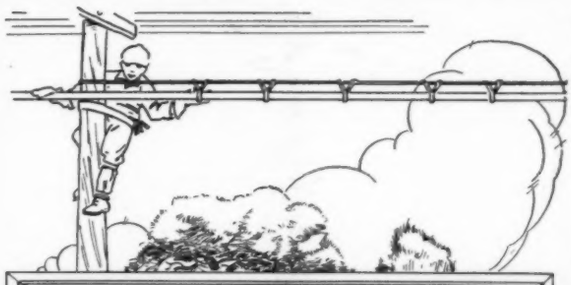

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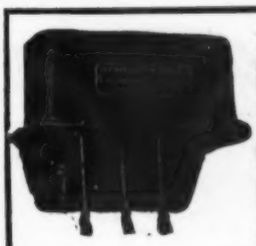

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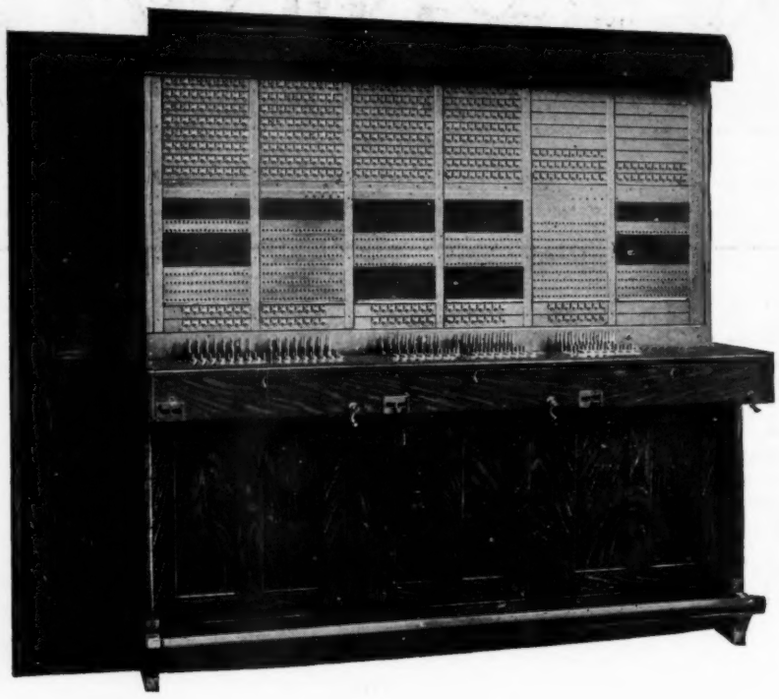

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Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone, Sound Waves
PUBLISHED WEEKLY BY TELEPHONY PUBLISHING CORP.
608 S. Dearborn St., Chicago

H. D. FARGO, President and Treasurer
S. R. EDWARDS, Editor and Secretary

J. R. HASTIE, Vice-President and Advertising Manager
H. D. FARGO, Jr., Western Advertising Manager

Entered as second-class matter September 4, 1908, at the postoffice at Chicago, Ill., under act of March 3, 1879.

Volume 87
Number 6

CHICAGO, SATURDAY, AUGUST 9, 1924

Subscription—10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

CURRENT OPINIONS AND COMMENTS

Public service companies in several states—including many telephone companies—have found it necessary to appeal to the federal courts in order to get what they considered a square deal in rate cases.

When the state commission refused adequate rates, the service company laid the matter before a United States court, asserting that the revenue offered meant confiscation of the property, which is in violation of the federal constitution—and almost invariably the company obtained relief.

This has happened so regularly that it seems to have got on the nerves of the local politicians who fight utilities, and they are trying to devise means to block it. The attorney general of New York state and the corporation counsel of the city of New York have come out in favor of a law to restrict the appeal of utility companies to the federal courts until they have exhausted the remedies in state courts.

This is the direct outgrowth of the battle over telephone rates in New York, in which the company took the case into the federal court and scored a victory over the state and municipal authorities. John W. Davis, nominee for President, handled the case for the company.

* * * *

It is no doubt natural for local authorities to resent repeated rebuffs from federal courts, but it is difficult for the layman, unskilled in the law, to see how this proposal can prevent a service company from protecting its constitutional rights.

Such appeals by service companies to the federal courts are based on the Fourteenth amendment to the constitution which lays down the principle that states shall not "deprive any person of life, liberty or property without due process of law."

No one denies that rate-making is a process of law in most of the states, but, if the state courts do not grant the utility the relief it claims, what is to prevent it from then appealing to the federal judiciary? A constitutional question is involved, so why should not a federal court pass upon it?

And if a federal court is to pass upon it eventually, why not at the outset, and so save much litigation in the state courts?

* * * *

As a matter of fact, in the New York telephone rate case, after the company had obtained relief in the federal court, the local objectors steered the proceedings into a state court, hoping to turn the tables, but that court upheld the decision of the federal judge in favor of the service company.

Unfortunately for their political plans, the utility-baiters hardly have the courage to propose a law preventing service companies from defending themselves at all, although this idea would fit into their program very nicely.

* * * *

General Chas. G. Dawes, Republican nominee for Vice-President, has the reputation of plainly speaking his mind, and particularly he does not mince his words when he discusses political demagogues who pose as "friends of the people" when they attack business. It was the theme of his first public address after his nomination five weeks ago.

Back in 1920, when all the Chicago utility companies were being attacked by politicians on the rate question, and their credit was threatened, the bankers held a conference to decide what to do. General Dawes was present and spoke from the shoulder. TELEPHONY quoted his words then, and they are worth repeating at this time when the same issue of making utilities the football of politics is being agitated all over the country. Here's what he said:

"We hear of those who are fighting for the people. The best move for the interests of the people would be to assure the stabilizing of the utilities. I do not know how we will get them out of politics, as long as we live in a democratic city, and we have continually before us the 'friends of the people.'

"The city must either take the properties and operate them, which would be costly in the end, or else treat the corporations with the spirit of fairness that will assure their credit status. These political arguments are not on the square.

"Some one must stand before the demagogic and unfounded attacks by the so-called 'friends of the people.' The interest of the people lies in the ability of the utilities to run on a business basis."

* * * *

During the next three months before election, while the political ballyhooers are trying to lure the voters into their tents, we can expect to hear a flood of stuff

about the country going to the dogs if this or that program is not adopted.

According to each school of demagogy, of course, the only way out is to vote that particular crowd into office. Meanwhile, the average citizen should consider the following figures, issued August 1 by a leading banking institution:

"In reviewing the financial and commercial events and changes of the first half of 1924, the one great outstanding evidence of the fundamental stability of this country appears in the net per capita national debt which, on July 1, 1924, amounted to $81. *This is a better showing than is made by any other of the principal countries of the world, including even those which were not engaged in the world war.*

During the fiscal year almost 1100 million dollars of our national debt were paid off, or more than 5 per cent of our gross debt and more than 10 per cent of our net national debt. Allowing only for the payments to be made to us by Great Britain and for the sinking fund provided by law, our entire national debt could be paid off in less than 30 years, no allowance being made for amounts of principal and interest which may be paid to us by our other allies."

Gross debt of the United States July 1 was 21,251 millions, compared with 22,350 millions a year ago. At that time the per capita debt was $94.12.

Regardless of the nightmares described by overheated campaign orators, this seems to be a pretty good country to live in after all.

* * * *

American inventive genius is universally acknowledged, but most people will be surprised at the announcement of the Secretary of the Interior that Patent No. 1,500,000 has recently been issued by the government patent office. Quite appropriately, it was granted to a Connecticut Yankee for a new type of submersible vessel designed to navigate under ice.

In celebration of reaching the 1,500,000 mark, the patent office gives out some interesting data regarding the development of inventions. The first patent granted after the creation of the patent office was in 1836. Prior to that date patents were issued by direct authority of the President, and between 1790 and 1836, 9,967 patents were thus issued. This number is not included in the 1,500,000 record.

* * * *

From 1836 to 1893—the period which saw the railroad, the telephone, the telegraph and the electrical industry come into being—there were issued 500,000 patents. During the next 18 years the automobile, the airplane and wireless communication were developed, and between 1893 and 1911, the second 500,000 patents were issued.

The third period, covering 13 years, from 1911 to 1924, the third half-million patents were granted. This era is notable mostly for generally intensive pursuit of improvements, particularly in connection with labor-saving devices, including automatic machinery.

The record shows that the first period of 57 years, from 1836 to 1893, saw more changes that profoundly affected world civilization than any thousand years previous. What progress will be made in the next 57 years—or even 25—no man dares try to measure.

COMING CONVENTIONS.

Indiana, Indianapolis, Claypool Hotel, September 17 and 18.

U. S. Independent Telephone Association, Chicago, Hotel Sherman, October 21, 22, 23 and 24.

Illinois, Peoria, Jefferson Hotel, November 12 and 13.

Personal Touch in Rural Collecting

Here Is an Interesting Article on the Personal Touch Applied to Rural Collecting in Which Some Actual Experiences Are Related—Paper Awarded Second Prize in Commercial Division in "Telephony's" Article Contest

By Miss Nelle M. Roberts,

Central Mutual Telephone Co., Rockwell City, Iowa.

"I'll leave it to you," were the words that fell from the manager's lips, fell like the dull, thud-like clods on a casket. This was the final result of a conference between the manager of the Upstate Telephone Co. and his bookkeeper on the subject, "How to extract money from delinquent subscribers."

Perhaps, you will think it is not good policy to let accounts run so long. It was back in the year 1920, in the farming community in northwest Iowa. Farmers had been feeling rich in 1918 and 1919 at the close of the war. Money was plentiful then; everybody was spending it freely and seemed to have enough for many luxuries. Crops had been good and the prices were all that anyone could ask.

The local telephone company had had no need to worry over collections during those prosperous years. The farmers had fine crops; in fact, Iowa boasted that she had enough corn, oats and stock to feed the world. The great financial trouble came in 1920.

There was an abundance of all kinds of crops, but the railroad company did not furnish cars to move this immense lot of grain, stock and other provisions from the farms. Nothing was moving. An empty car left on the siding at any town was an event that would have been greeted by the band had the people known when one would be in, they were so eager to get them.

"I'll leave it to you," rang through Molly Ann's thoughts—Molly Ann was the bookkeeper. Notices to telephone subscribers did no good; pleading letters proved of no avail.

"What can I do?" sighed Molly Ann as she noted the lines deepen on the manager's brow. "I'll leave it to you," came back the response.

"Do other companies ever let their bills run like we do?" questioned Molly Ann.

"I'll leave it to you," echoed her thoughts.

Time wore on until between $10,000 and $11,000 were outstanding on the company's books. There were no large accounts, but there were so many small ones.

Now, Molly Ann was a lover of nature; especially did she like to get out in the autumn sunshine and fill her lungs with the invigorating atmosphere. She conceived the idea that, perhaps, a system of collecting by the "personal touch" method might prove beneficial, financially. Had she not used every method of persuasion she knew? She had sent notices, had written letters.

Thinking the matter over, she asked the manager for a Ford and a driver, and with her collecting file filled with bills, amounting in the neighborhood of $10,000, she started out with the words ringing in her ears, "I'll leave it to you."

"Wonder if I will make good," sighed Molly Ann.

This was to be an educational trip as well as one of collection—the subscribers were not the only ones to be educated, either. It was Molly Ann's duty to instruct the subscribers of the local company, teaching them the fact that it takes money to run a telephone exchange.

Money was tightening up everywhere in Iowa, and it was hard for the telephone company to borrow money, as well as the farmer. The telephone company in that part of the state depends upon the farming community, as well as the small town, for its business.

Molly Ann was to receive some education by meeting these farmer folks, seeing the conditions and learning their problems and how to collect money. This was a new adventure in her field of collection. Never had it been necessary for the Upstate Telephone Co. to send a collector to the rural districts.

Miss Roberts Has the Ability to Present Most Interestingly Her Everyday Experiences in Telephone Work.

On a bright day in autumn, Molly Ann "Bookkeeper," with her Ford, driven by Mr. Repairman, were on their way.

"Good morning, Mrs. Allan, I am the bookkeeper of the Upstate Telephone Co. I have your receipt with me this mornnig. Perhaps you received our letter some time ago telling you of our pressing need for money?"

"Yes, Miss Bookkeeper," says Mrs. Allan, "we should have paid that account long ago. We have never let our bills run so long, but perhaps you do not know how the farmer is suffering. Grain all around us, prices high, but we are unable to sell a bushel. The dealers can not take our grain.

"I thought the telephone company could wait. We get so accustomed to collection letters now that we do not pay attention to them. We have always been prompt about paying our rent."

"Yes," said Molly Ann, "we have always been able, when we needed a little money to tide us over, to go to a bank and borrow for a few days, but it is impossible for us to do that now. Our help must be paid every month."

"I am so glad you told me this. We seemed to think the telephone company could run on and on without our small account. But now that you have explained that you have so many accounts like ours, I can understand your need, and will give you the money for our account."

After Molly Ann visits a short time with the busy mother, about her children, her house, her chickens and other interests, she drives on to her next delinquent subscriber.

"I am Molly Ann, bookkeeper of the Upstate Telephone Co. How about helping us out on our finances today by buying this little piece of paper which I have here? Perhaps it has not been convenient for you to call at the office."

"I am so glad someone from the telephone office called," replied Mrs. Keary; "our telephone has been out of commission for so long that I just want to talk to you about it."

"I will have Mr. Repairman come right in and fix your telephone. We do not want you to be without service but, of course, you must let us know when your telephone is not working," says Molly Ann. "We like the motto which we see used sometimes, 'If our service pleases you, tell others; if not, tell us.'"

"While Mr. Repairman is working on the telephone, I will give you a check for our rent," says Mrs. Keary. "We farmers are hard pressed for money at this time. You see, we can not sell any grain; wonderful prices, too. Will you take some of these apples? Sorry you had to come out this far just for our money, but we just neglected paying our account."

"Thank you, Mrs. Keary, and good-bye. If your telephone gives any more trouble, let us know," smiled Molly Ann as she drove away.

On and on they drove, stopping here, missing the next house; greeted, scolded, insulted, but nothing daunts Molly Ann, Always she is hearing those words, "I'll leave it to you." If she wanted to stop or turn back, those words acted as an incentive to keep her going. Molly Ann is not discouraged; she has to climb through wire fences; walk the plowed ground, hunt for people who seem to be away from home. All difficulties she surmounts.

Mrs. Floyd reports her telephone has not worked for a long time. "It is a perfect nuisance, and I will not pay for it until it is fixed."

"I am so glad I have a repairman with me. I will call him in," replies Molly Ann.

Mr. Repairman hurriedly repairs and adjusts the telephone and soon has the telephone in working order. "Just try it out, Mrs. Floyd."

After a clear conversation with the neighbor, she reports the telephone working well, pays her bill and Molly Ann leaves in good spirits, after a short chat with Mrs. Floyd.

"I never handle the money," says Mrs. Deems. "You will have to see Mr. Deems, and he is out in the field."

"Whenever we wish to liven up a district meeting," said a state association secretary, "we just bring up the subject of collections."

That is what Miss Nelle M. Roberts, of the Central Mutual Telephone Co., of Rockwell City, Iowa, evidently had in mind when she sent in her entry for "Telephony's" prize article contest.

Miss Roberts has always been engaged in work in which she has come into contact with all forms of human nature—and in her article she portrays many types. Prior to becoming filing clerk for the Central Mutual in 1912, Miss Roberts had taught school, served as deputy county recorder and recorder.

With the telephone company she has been cashier, bookkeeper, chief operator—and when Manager Perry C. Holdoegel goes to Des Moines during the session of the legislature where he represents his district in the senate, Miss Roberts operates the business as assistant manager.

The Central Mutual company has six exchanges with about 3,800 telephones. It has had a steady growth covering practically an entire county.

Miss Roberts' activities, both in a business and personal way, set a high standard for telephone women. Her hobby she says is "love for doing work that makes others happy"—but Perry Holdoegel says it is "doing everything that people ask of her—and then going out and hunting up other work."

Anyway Miss Roberts does get a great deal of enjoyment out of Junior Sunday School work, and club work. As chairman of the civic department of the Chamber of Commerce, she has been active in beautifying her home city and establishing a playground and tourist park.

She holds membership in these organizations—and it's "active" membership, too: Rockwell City Chamber of Commerce, Business and Professional Women's Club, Order of the Eastern Star, P. E. O., and the Women's Club.

The various papers that Miss Roberts has presented at the district meetings and the state conventions and published in "Telephony," indicate her natural ability as a writer in setting out facts in a most interesting manner.

"Thank you, Mrs. Deems, a fine morning, this," says Molly Ann as she inquires the way to Mr. Deems. A walk across plowed ground, through wire gates, she at last finds Mr. Deems. Introducing herself, she is told the same story of the grain in the bins and no sales, but Mr. Deems regrets that so much trouble had to be taken to get his telephone rent.

"I will make it worth your while to come way out here, and at the same time save a little money myself. I will pay my current bill and pay for a year in advance, thereby getting the benefit of the discount."

Molly Ann beams with appreciation, and feels that her efforts were not in vain, and that she is having some degree of success.

Always she stopped a few minutes to visit or chat with the subscriber, learning about his problem and he about hers; always leaving them with a friendly feeling toward the company for which she works, for so few people think of the telephone company as being made up of real folks. Not having met the telephone people personally, they think of the company more as of a machine.

About noon they arrived at a little rural store, and Mr. Rogers, who is very exacting in all his dealings, checked over each toll message. Every one must be accounted for and remembered. An hour was spent by Molly Ann calling in to the office to check up all the details on the tickets and give Mr. Rogers all the information.

Finally, Molly Ann leaves another satisfied customer—and he chuckles to think how he made the little bookkeeper earn his money before she got it.

Autumn in Northwest Iowa is a wonderful time of the year. The roads are at their best; the trees have taken on the autumnal hue of reds and orange and browns; the golden ears of corn are peeping through their coats of fading green; Indian summer, with the sun's rays softened by a filmy haze—all lent their softening tones to Molly Ann's task.

Much time was spent explaining why the telephone company could not carry accounts, many customers arguing that they had always paid before, all of which did not help the situation for Molly Ann. She had hundreds of accounts amounting from $18 to $20 each, and they totaled thousands of dollars.

Some pathetic conditions were encountered by Molly Ann in her "Personal Touch" system of collecting. Near the close of one day's work, they drove into a farmyard. The farmer came out to meet them. He seemed so sad. Molly Ann explained her mission.

The farmer reached into his pocket, produced a cream check and handed it to Molly Ann, saying: "We have had some heavy expense recently. Our baby toddled out into the road, was struck by a passing automobile and killed. The expense of the funeral has taken about all our money."

The cream check almost burned Molly Ann's fingers. What should she do? She stopped to talk to the man, letting him tell his story, which seemed, in a measure, to give him relief.

"The telephone was a source of great convenience when we were in trouble," said he. "We could hardly get along without it, but if you can wait for a few months, until we can sell something, we will pay."

The telephone was not removed.

No such a reception greeted Molly Ann at her next stop. Often there were dogs that rushed out to meet her, after being aroused by the approach of a car. At this farmhouse, out bounded the dogs. The home looked as though no one were there.

As was Molly Ann's habit, she snapped her fingers and played when the dogs approached, but one dog leaped for her throat as she neared the house. She quickly whirled, and all the dog succeeded in getting was a piece of Molly Ann's coat. Weak and limp, she managed to get to the car ahead of the dog, and departed without leaving her card, or any token of her mission.

Seven long days Molly Ann and Mr. Repairman drove, and argued, explained and visited, with the rural folks of their company. No telephones needed to be removed. Some days were rewarded with much fruit for their labor; other days were not so well repaid financially.

However, better relations were established with the rural subscribers. Molly Ann got in touch with the problems of the community, and the rural folks learned more about the telephone company. Molly Ann became so expert at taking an inventory upon the approach to a farm, looking for grain, crops and stock, that she could, in a measure, estimate the degree of success she would have upon approaching the farmer.

Molly Ann believes firmly in the system of "Personal Touch," because as a result of this system she was instrumental in collecting between $7,000 and $8,000. Now when the manager says, "I'll leave it to you," Molly Ann has no dread of finding a new method.

Convention of Inter-American Conference Unsigned by U. S.

Delegates of the United States refrained from signing the convention drawn up by the inter-American electric conference, which ended July 22 after being in session at Mexico City for nearly two months.

The United States delegates based their refusal on the grounds that the document is inconsistent with private ownership of public utilities, as its regulations invade the field of management, and attempt to establish arbitrary rates without regard to facilities of service.

The United States was in a unique position in the conference, as the telegraph and telephone systems in the other countries represented are uniformly govrnment monopolies. The convention was signed by all the South and Central American countries in the conference.

The delegates stated that the outcome is likely to hamper the development of cable facilities in the Americas, as all of the big companies which are United States owned will be cautious about expanding in the face of adverse regulation.

The United States government sent down its ablest experts to assist its representatives in the conference in the hope of devising means of improving radio communications, but their draft proposals were ignored, it is stated.

The convention signed by the Latin American nations will not go into effect until July 1, 1926. Another conference will be held next year in Rio de Janeiro to conclude the work begun in Mexico City.

During the progress of the conference the American Telegraph & Telephone Co. conducted experiments in radio receiving. A special receiving apparatus was set up, and the delegates invited to listen in on the daily New York-London tests. A powerful New York station transmitted every morning from 6 to 9 o'clock New York time. The messages were received clearly in Mexico City on some days, but on others the static was so bad that not more than half of the words could be heard.

Time of Day Subject of Most Frequent Oklahoma Inquiry.

The Southwestern Bell Telephone Co. claims that the subject of most universal and most frequent interest to the public in Oklahoma has to do with the time of day.

The Oklahoma City office of this company receives and handles approximately 240,000 calls daily, according to a recent survey. This is an average of two calls for each man, woman and child in Oklahoma City. Of that number, 16,765, or approximately 7 per cent are requests for the time. The Western Union Telegraph Co. states that it handles about 2,000 such calls daily.

It is said that by far the greater number of these calls are recorded between seven and nine o'clock in the morning and are made by school children who either have no clocks at home or have more confidence in the telephone company than in the clocks.

Prices in the Metal Markets.

New York, August 4—Copper—Firm. Electrolytic, spot and futures, 13⅛@13¼c. Tin—Firm; spot and futures, $50.50. Iron—Steady; No. 1 northern, $19.50@20.00; No. 2 northern, $19.90@19.50; No. 2 southern, $18.00@18.50.

New Transmission Efficiency Unit

"Mile of Standard Cable" Replaced by New Unit for Expressing Transmission Efficiency—Relative Merits of Two Units—Paper Presented at Annual Convention of the American Institute of Electrical Engineers at Chicago

By W. H. Martin,

Department of Development and Research, American Telephone & Telegraph Co.

The "mile of standard cable" has been used in telephone engineering in this country for over 20 years, and during that time has been adopted in other countries, as the unit for expressing the transmission efficiency of telephone circuits and apparatus. In the present state of the telephone art, this unit has been found, however, to be not entirely suitable and it has recently been replaced in the Bell system by another unit which for the present, at least, has been called simply the "transmission unit."

Before considering the reasons for such a fundamental change and the relative merits of the two units, it may be well to review briefly the general method of determining the efficiency of such circuits and the apparatus associated with them.

The function of a telephone circuit is to reproduce at one terminal the speech sounds which are impressed upon it at the other terminal. The input and output of the circuit are in the form of sound, and its efficiency as a transmission system may be expressed as the ratio of the sound power output to the sound power input. For commercial circuits, this ratio may be of the order of 0.01 to 0.001.

In the operation of the system, the sound power input is converted by the transmitter into electrical power, which is transmitted over the line to the receiver and there reconverted into sound power.

The effect of inserting a section of line or piece of apparatus or of making any change in the circuit can be determined in terms of the variation which it produces in the ratio of the sound power output to the sound power input, or, if this latter is kept constant, in terms of the ratio of sound power output after the change to that obtained before the change was made.

It should be noted particularly that the change in the output power of the system is the real measure of the effect of any part of the circuit on the efficiency of the system and that the ratio of the power leaving any part to that entering it is not necessarily the measure of this effect. For example, a pure reactance placed in series between the transmitter and the line, may change the power delivered to the line by the transmitter and hence the output of the receiver, the magnitude and direction of the change being determined by the impedance relations at the point of insertion.

The ratio of the power leaving the reactance to that entering it is, of course, unity, as no power is dissipated in a pure reactance. In other words, the transmission efficiency of any part of a circuit cannot be considered solely from the standpoint of the ratio of output to input power for that part, or the power dissipated in that part, but must be defined in terms of its effect on the ratio of output to input power for the whole system.

By determining the effect of separately inserting the many pieces of apparatus that may form parts of typical telephone circuits, an index can be established for each of these parts of its effect on the efficiency of the circuit for the conditions of which the circuit tested is typical. Similarly, the power dissipated in unit lengths of the various types of line can be determined by noting the change in power output of the receiver caused by increasing any line by a unit length.

Such indices of the transmission efficiencies of the various parts of a circuit obviously have many applications in designing and engineering telephone circuits. These indices could be taken as the ratios expressing the change in the output power of the system.

This, however, has certain disadvantages. For example, the combined effect of a number of parts would then be expressed as a product of a number of ratios. Likewise, for the case of a number of parts n of the same type in series, such as a line n miles in length, the effect would be expressed as the ratio for one part or one mile of the line, raised to the nth power.

In many cases, these ratios and the powers to which they would need to be raised would be such as to make their handling cumbersome. If, however, these indices are expressed in terms of a logarithmic function of a ratio selected as a unit, the sum of any number of such indices for the parts of a circuit is the corresponding index for the power ratio giving the effect of the combination of these parts.

The "mile of standard cable" is such a logarithmic function of a power ratio. The new unit also meets this important requirement.

Definition of the Transmission Unit.

The "transmission unit" (abbreviated $T\ U$) has been chosen so that two amounts of power differ by one transmission unit when they are in the ratio of $10^{.1}$ and any two amounts of power differ by N units when they are in the ratio of $10^{N(.1)}$. The number of transmission units corresponding to the ratio of any two powers P_1 and P_2, is then the common logarithm (logarithm to the base 10) of the ratio P_1/P_2, divided by 0.1. This may be written $N = 10 \log_{10} P_1/P_2$.

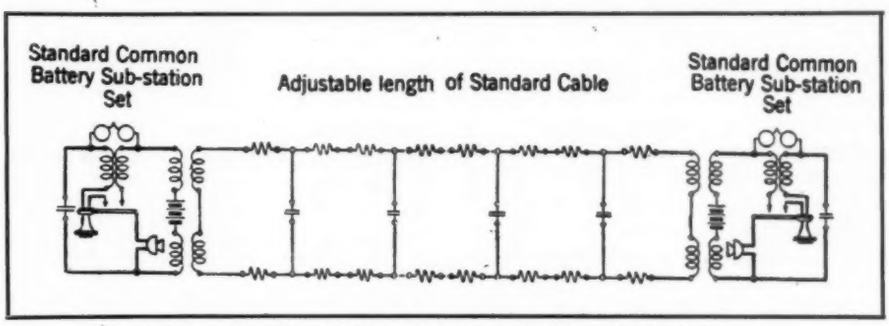

Fig. 1. Circuit of What Has Been Called "Standard Cable."

Since N is a logarithmic function of the power ratio, any two numbers of units, N_1 and N_2, corresponding respectively to two ratios, P_a/P_b and P_c/P_d, may be added and the result $N_1 + N_2$, will correspond to the product of the ratios, $P_a/P_b \times P_c/P_d$.

The reasons for the selection of this unit and the method of applying it, can probably be best brought out by a consideration of the practice which has been followed in determining and expressing the efficiencies of telephone circuit and apparatus in terms of "miles of standard cable."

Standard Reference Circuit.

Fig. 1 shows what has been designated the "standard reference circuit." It consists of two common battery telephone sets of the type standard in the Bell system at the time this circuit was adopted, connected through repeating coils or transformers to a variable length of "standard cable."

This cable is an artificial line having a resistance of 88 ohms and a capacity of

0.054 microfarad per loop mile which is representative of the type of telephone cable then generally used in this country.

For a given loudness of speech sounds entering the transmitter at one end of the circuit, the loudness of the reproduced sounds given out by the receiver at the other end can be varied by changing the amount of standard cable in the circuit. Also, the amount of cable in the circuit can be used to express the ratio of the power of the reproduced sounds to that of the impressed sounds.

Due to the dissipation of electrical power in the cable, this ratio and consequently the loudness of the reproduced sounds become less as the amount of cable is increased and greater as the length of cable is decreased.

This circuit then became the measuring or reference system for engineering the telephone plant, and the "mile of standard cable" became the unit in which the measurements were expressed. This circuit was used to set the service standards in designing and laying out the telephone plant.

Thus, the reproduction obtained over this circuit with a length of cable of about 20 miles was found suitable and practicable for local exchange, that is, intra-city service, and that corresponding to about 30 miles for toll or intercity service.

Any telephone circuit was rated by its comparison with the standard circuit. This comparison was on the basis of a speaker talking alternately over the circuit to be measured and the standard circuit and a listener switching similarly at the receiving ends, the amount of cable in the standard circuit being adjusted until the listener judged the volume of the sounds reproduced by the two systems to be equal. The number of miles of cable in the standard circuit was then used as the "transmission equivalent" of the circuit under test.

The effect of any change in the circuit under test on the efficiency of that circuit could then be measured by determining the variation in the amount of standard cable required to make the sounds reproduced by the two systems again equal, and the number of miles of standard cable required to compensate for this change was used as the index of this effect.

In this way the relative efficiencies of two transmitters or receivers could be determined. Likewise, the power dissipation per unit length, or the atttenuation, of the trunk in the circuit under test could be equated to miles of standard cable.

Since in each case, the standard cable is used to adjust the volume of the reproduced sound, "the mile of standard cable" corresponds to the ratio of two amounts of sound power, or as this change in sound power is produced by changing the power delivered to the telephone receiver, to a ratio of two amounts of electrical power.

If the addition of a mile of standard cable to a long trunk of the standard circuit causes the power reaching the end of the trunk to decrease by a ratio r, then the insertion of two miles will decrease the received power by a ratio of r^2 of that obtained before the two miles were inserted. A number of miles of cable, n, inserted will reduce the received power to a ratio r^n.

Thus the power ratio corresponding to any given number of miles of cable is an exponential function of the ratio corresponding to one mile, the exponent being the length in miles. The length in miles is, therefore, a logarithmic function of the power ratio.

In an infinite length of uniform line having resistance, inductance, capacity and conductance of R, L, C and G per unit length, the attenuation a per unit length, of a current of frequency f flowing along the line can be shown to be equal to the real part of the expression

$$a+j\,b=\sqrt{(R+j^2\,\pi\,f\,L)\,(G+j^2\,\pi\,fC)}$$

For the standard cable line, since L and G are zero

$$a=\sqrt{\pi\,f\,R\,C}$$

and since $R=88$ ohms and $C=0.054$ microfarad per mile the current attenuation per mile of standard cable is

$$a=0.00386\,\sqrt{f}$$

If I_1' and I_2' are the currents, respectively at the beginning and end of a mile of line, then

$$I_1'/I_2'=e^a \text{ or } a=\log_e I_1'/I_2'$$

Similarly if I_1 and I_2 are the currents, at points 1 and 2, respectively, at the beginning and end of a section of L miles

$$I_1/I_2=e^{La} \text{ and } L\,a=\log_e I_1/I_2$$

For this case, the effect of inserting the section of L miles into the line on the current at point 2, or at any point beyond 2, is that the currents at the point before and after the insertion are in the same ratio as I_1/I_2. Furthermore, since the impedance of the line looking toward the receiving end is the same at points 1 and 2 (and at any other points), then the ratio of the powers at the two points is equal to the square of the current ratio. Thus the power attenuation is represented by

$$P_1/P_2=(I_1/I_2)^2=e^{2a}$$

Similarly for a line, terminated in a fixed impedance which may be different from the characteristic impedance of the line, the ratio of the powers received before and after a change in the length of the line is equal to the square of the ratio of the corresponding currents.

On the basis of this relation, and because it is in general more convenient to measure or compute currents than powers, the current ratio has often been used in determining the equivalent of any piece of apparatus or line in terms of standard cable.

It should be noted, however, that such a current ratio can be properly used as an index of the transmission efficiency of a part of a circuit only when it is equal to the square root of the ratio of the corresponding powers. Also, of course, the voltage ratio can be similarly used when it meets the same requirement.

Limitations in Use of Standard Cable Unit.

As has been shown, the attenuation, either of current or power, corresponding to the mile of standard cable is directly proportional to the square root of the frequency of the current under consideration. This means that the standard cable mile corresponds not only to a certain volume change in the reproduced speech sounds, but also to a distortion change.

For comparisons between the standard cable circuit and commercial circuits with talking tests, and as long as most of the commercial circuits had distortion comparable to that of standard cable, this twofold effect of standard cable was desirable.

At present, however, many types of circuits are being used which have much less distortion than standard cable. Also, the use of voice testing has been largely given up in the plant and it is now the general practice to determine the efficiency of circuits and apparatus on the basis of measurements and computations for single-frequency currents, a correlation having been established between these latter results and those of voice tests.

These factors have made it desirable to have a unit for expressing transmission efficiencies which is distortionless, that is, is not a function of frequency.

Qualifications of a New Unit.

The consideration of a new unit for measuring transmission efficiency brought out the following desirable qualifications:

1. *Logarithmic in Character.* Some of the reasons for this have already been discussed. In addition, the application of such a unit in measurements of sound make a logarithmic unit desirable, since the sensation of loudness in the ear is a logarithmic function of the energy of the sound.

2. *Distortionless.* The advantages of a unit which is independent of frequency have been referred to previously. In expressing the efficiency of the transmission of the high frequencies involved in carrier and radio circuits such a unit is particularly desirable.

3. *Based on Power Ratio.* This is desirable because the power ratio is the real measure of transmission efficiency. As has been pointed out, the current ratio can be used only when it is equal to the square root of the power ratio. Having the unit based on a power ratio does not, of course, require that measurements or computations be made on a power basis.

In considering the conversions between sound and electrical energy, it is obviously advantageous to have a unit based directly on a power ratio.

4. *Based on Some Simple Relation.* This is desirable in connection with the matter of getting a unit which may be widely used and may find applications in several fields.

5. *Approximately Equal in Effect on Volume to a "Mile of Standard Cable."* One reason for this is the practical one of avoiding material changes in the conceptions which have been built up regarding the magnitude of such things as transmission service standards. Also, the sound power changes which can be detected by the ear are of the order of that corresponding to a mile of standard cable.

In measuring telephone lines and apparatus with single-frequency currents, it has been found that an accuracy of about one-tenth of a mile can be obtained readily and is sufficient practically.

6. *Convenient for Computations.* This refers to the matter of changing from computed or measured current or power ratios to transmission units or vice versa.

Properties of the Transmission Unit.

A consideration of these qualifications and of the various units suggested, led to the adoption of the power ratio of $10^{.1}$ as the most suitable ratio on which to base the unit of transmission efficiency.

The transmission unit is logarithmic, distortionless, is based on a power ratio and its relation to that ratio is a simple one. Its effect on the transmission of telephonic power corresponding to speech sounds is about 6 per cent less than that of one mile of standard cable. Regarding its use in computations, it has the advantage that the number of units corresponding to any power ratio, or current ratio, can be determined from a table of common logarithms.

For a power ratio of 2, the logarithm is 0.301 and the corresponding number of units is, therefore, this logarithm multiplied by 10, which is 3.01 *T U*. For a power ratio of 0.5, the logarithm is 9.699—10 = —0.301 and the number of units is —3.01 *T U*.

A power ratio of 2 represents a gain of 3.01 units, and a power ratio of 0.5 corresponds to a loss of 3.01 units. If the foregoing ratios were for current, the logarithms would be multiplied by 20. Thus a current ratio of 2 corresponds to a gain of 6.02 units and a current ratio of 0.5 corresponds to a loss of 6.02 units.

It will be noted that the *T U* is based on the same ratio $10^{.1}$ as the series of preferred numbers which has been used in some European countries and has been proposed here as the basis for size standardization in manufactured articles.* In common with this series, the *T U* has the advantage that many of the whole numbers of units correspond approximately to easily remembered ratios as shown in the following table:

Approximate Power Ratio.

Transmission Units	For Losses Fractional	For Losses Decimal	For Gains Decimal
1	4/5	0.8	1.25
2	2/3	0.63	1.6
3	1/2	0.5	2.
4	2/5	0.4	2.5
5	1/3	0.32	3.2
6	1/4	0.25	4.
7	1/5	0.2	5.
8	1/6	0.16	6.
9	1/8	0.125	8.
10	1/10	0.1	10.
20	1/100	0.01	100.
30	1/1000	0.001	1000.

It will be seen that the ratio for a gain of a given number of *T U*, is the reciprocal of the ratio for a loss of the same number of units. Also for an increase of 3 in the number of units, the loss ratio is approximately halved and the gain ratio doubled. If the approximate loss ratios corresponding to 1, 2 and 3 units are remembered, the others can be easily obtained.

From this consideration of the properties of the transmission unit, it is evident that there is much to commend its use in telephone transmission work. Furthermore, since its advantages are not peculiar to this work, such a unit may find application in other fields. It is now being used in some of the work on sound.

New Transmission Reference System.

With the standardization of the distortionless unit of transmission it is desirable also to adopt for a transmission reference system a telephone circuit which will be distortionless from sound input to the transmitter to sound output from the receiver.

This system will consist of three elements, a transmitter, a line and a receiver. Each will be designed to be practically distortionless and the operation of each will be capable of being defined in definite physical units so that it can be reproduced from these physical values.

Thus the transmitter element will be specified in terms of the ratio, over the frequency range, of the electrical power output to the sound power input, this ratio being expressed in transmission units. The receiver element will be specified likewise in terms of the ratio of sound power output to electrical power input.

The output impedance of the transmitter and the input impedance of the receiver elements will be 600 ohms resistance. The line will be distortionless with adjustments calibrated in transmission units and will have a characteristic impedance of 600 ohms resistance.

Such a reference system is now being constructed. The transmitter element consists of a condenser type transmitter and multi-stage vacuum tube amplifier. The receiver element consists of an amplifier and specially damped receiver. Each element is adjusted to give only negligible distortion over the frequency range.

It is proposed when this system is completed and adjusted that it will be adopted as the transmission reference system for telephone transmission work. Other secondary reference systems, employing commercial-type apparatus will be calibrated in terms of the primary system and used for field or laboratory tests when such commercial type systems are needed.

*"Size Standardization by Preferred Numbers," C. F. Hirshfeld and C. H. Berry, Mechanical Engineering, December, 1922.

Telephone Pioneers of America to Meet in Chicago in October.

The Telephone Pioneers of America will hold their eleventh annual meeting and the third annual meeting of the general assembly at the Edgewater Beach Hotel in Chicago, October 10 and 11. The tentative program follows:

THURSDAY, OCTOBER 9—EVENING

Registration of pioneers and other visitors. General get-together at hotel with music and dancing.

THURSDAY, OCTOBER 9—8 P. M.

Third meeting of the general assembly. All members are requested to be present at the roll call.

FRIDAY, OCTOBER 10—10 A. M.

Eleventh annual meeting of the association. (Speakers to be announced later.)

FRIDAY, OCTOBER 10—AFTERNOON

In accordance with the wishes of the Pioneers, Friday afternoon has been left open for them to follow their own plans and desires.

FRIDAY, OCTOBER 10—EVENING

Moving pictures featuring the telephone business and dancing at the hotel.

SATURDAY, OCTOBER 11—MORNING.

The Pioneers will be taken on a visit to the Western Electric Co.'s plant at Hawthorne. Buses will leave Edgewater Beach Hotel at 8 a. m. and return from Hawthorne, leaving at 11:45 a. m. The party will be returned to the hotel by way of the business district. Buses will stop to drop members of the party who wish to remain downtown.

SATURDAY, OCTOBER 11—AFTERNOON.

Left open to the Pioneers to follow their own inclinations.

SATURDAY, OCTOBER 11—EVENING

An informal entertainment by telephone people under the auspices of Theodore N. Vail Chapter No. 1 at the Edgewater Beach Hotel.

Reservations and requests for information are being handled by R. H. Starrett, 195 Broadway, New York, N. Y. All reservations must be in his hands not later than October 1.

District Meetings of Wisconsin State Telephone Association.

Five district meetings are to be held by the Wisconsin State Telephone Association during the month of August. They are scheduled as follows, according to an announcement recently sent out by Secretary John A. Pratt: Ashland, August 14; Rice Lake, August 19; Phillips, August 22; Neillsville, August 26, and Menomonie, August 29.

Talk-it-Over Monthly "Get-Together"

Employes of Johnson County Telephone Co., Warrensburg, Mo., Hold Monthly Get Together Meetings to Discuss Various Phases of Their Daily Work—Here Are Some of the Papers Presented at These Meetings

Why an Operator Should Be Careful in Handling Telephone Equipment.

By Miss Marie Blake.

An operator should be careful in handling telephone equipment because when she takes up the duties entrusted to her she becomes a part of the telephone business.

The first and most important duty of an operator is rendering public service. Service is that which the public is buying, the company is selling, and the operator is furnishing. Therefore the operator should handle the telephone equipment with much care.

An operator should feel it as much to her interest as to the company's to be careful with the telephone equipment. We must first realize what it is to be an operator before we can feel responsible for the telephone equipment. With this interest in the work, we will feel the responsibility of an operator, and we will be better able to take care of the equipment.

We should be careful in keeping the restroom neat and clean. In this way we help a new operator to become interested in her work.

The switchboard is the heart of the entire telephone system. Therefore, great care should be taken in the handling of the plugs and in making the connections. We should try to realize the value of the switchboard and what it costs for repairs. This is not only a help to the company but a help to the operator for she may then be of greater service to the public, by means of which a higher position is acquired. By saving the expense for repair the company will be more able to have better equipment in the offices.

The way in which an operator conducts herself and performs her duties brings out her characteristics as a business woman, and if well done establishes a firm foundation for greater work, for "Whatever is worth doing is worth doing well."

The Business Principles of a Small Telephone Exchange.

By Miss Vesta Shaw.

In the small town the manager or chief operator knows everybody, and everybody knows her. Hence she is in intimate touch with all the subscribers and knows their problems and desires, and in this way is able to give, more than likely, individual service. This is an ideal condition and should permit of a cordial relationship between the telephone company and the public.

The chief operator is directly responsible for the service in the office. Her duties are diversified and exacting. She must have patience and tact and should be a student of human nature, as well as of the details of the telephone service. Her personality should be pleasing, alike to her operators and subscribers.

It is also necessary to have close cooperation between the various employes of other departments of the company to successfully carry on the work. One of the most important duties is receiving and adjusting complaints from the subscriber. The subscriber must be convinced of the company's interest in this particular trouble, and satisfied that every effort will be made to correct the difficulty.

Another difficult problem is the handling of collections; many like to put off the evil day as long as possible, making more work for the collector.

I read a little story the other day showing that if the right spirit of co-operation and helpfulness is used great things can be accomplished. A tourist in traveling through Vermont arrived at a great stone quarry where three stone cutters were at work on a large block of granite. He asked the first man "What are you doing?"

He replied, "I am cutting stone." The second man, he asked the same question, "What are you doing?" "I'm working for $7.40 per day," the man answered. The third stone cutter was asked, "What are you doing?" "I'm building a cathedral" he replied.

In this story, which is applicable to the men and women engaged in telephone business, we find three kinds of people: one is serving time, another is serving himself and the greatest of the three, is serving society.

What Is a Good Operator?

By Miss Edith Barnett.

I wonder if it has ever occurred to each of us to ask ourselves, "Are we efficient workers?" "Are we good operators?"

You know in all walks of life there are the two distinct classes: those who are classed just as workers, and those who are classed as the good and efficient workers. If you have never been interested enough in your welfare to wonder just where you stand, whether or not you have asked yourself to what class you belong, let me tell you that question has been asked by someone about you. I dare say there was never an employe in any line of business who has not, at some time, had that question asked about him.

As Shakespeare has asserted, "All the world's a stage and the men and women merely players." What kind of a player are you? Each one has his or her part to play. Are you doing your very best? Are you an asset to the business with which you are connected? It makes little difference what profession you are in; if it is worth your time at all, it is worth doing well.

"Things done by half are never done well." So it is with telephony as well as any other profession. Yes, I say profession. To be able to operate a switchboard properly is a profession and one of which we should be very proud. It is an art within itself. If you sometimes feel as if you have a minor part, a part so little that you can shirk on the job and it is unnoticeable, you are wrong. The smallest defect will be detected some time.

How many of us like to see a play given at the leading theatre? We all do. We like the very best there is in everything, but do we in turn give our very best?

"It was only a little thing and yet if he had only played his minor part better the play might have been a great success,"

I am only one operator in a hundred, you are only one operator in a hundred, but our parts, though very small in themselves, help to carry on and promote one of the greatest achievements for mankind. If we do our work well, if we persevere and do everything in our power to do it right, even though we advance just a little each day, we are helping to make the business a success instead of a failure. If we help to build instead of holding back, then are we not classed as good operators?

In order to get the best results from employes, we all agree that they should be properly trained at the beginning. Every effort should be made on the part of the chief operator and her assistants to start the operator right. After this training has been given, then the rest is up to the operator.

To be classed as a good operator, one must know the fundamentals about operating; and after these are learned they must be put into practice. An operator must enjoy her work; she must find something fascinating about it. She must regret to be away from it.

The operator who has no more personal interest in her work than to be indifferent as to her attendance, who would just as

soon or rather be elsewhere as there and one who is willing to put anything and everything above her work cannot possible become an efficient one. The employe who is always on the job regardless of personal affairs is the one who is bound to push ahead toward the top of the ladder. No one in telephone work, or any kind of business, will succeed who arranges his work to suit his pleasure. We all know it is wrong. "When duty and pleasure clash, let the duty go to smash," is not the motto of a successful operator.

Two operators were overheard talking in the restroom, one a comparatively new operator. She had been taught and trained in the right way and although she enjoyed her work, yet she was human and on this particular day felt rather discouraged and blue. However, despite this she was ambitious and eager to learn.

"Oh, I wish I could work as fast as Dorothy. I sometimes wonder if I ever shall be as good as she is," said she.

"Don't let that worry you," said the other operator, "There is no use trying to please those hateful, unreasonable people. I tell you I don't care. Of course, you are a good operator. I am, you are, and so is Dorothy.

"Listen kid, take it from me, if you work anywhere for a year or two and get by, I mean, in other words, if you are not fired; there is no doubt about your being good. Just you manage to be here on time, or at least most of the time. Don't ask to be off too often and you will get along O. K. And do not work too hard either, the manager will never know it, if you do.

This is my mottor: Do what you want to let someone else do the rest; draw your check and forget it. Everyone for himself." Here the restroom door closed as they went back to their work, shutting out the remainder of the conversation.

Wouldn't you hate to have that operator handle your calls for you? An operator of that type and with that attitude toward her work is not only ruining her chance of success but possibly influences others with whom she works. If you are not personally interested in your work, the least you can do is not try to influence and discourage others.

Operators are engaged for the purpose of rendering service to the public. They are not good operators, efficient operators, unless they render more than service. They should give the "best of service." An operator must take such an interest in her work that it will become a part of her.

She should exert every vital spark of energy which she has in her work. She should come in the morning with the spirit and feeling that she is not just going to work because she is required to do so, but because she likes it. She should feel as if every subscriber is her friend and be willing and determined under any circumstances to give them the best service she is capable of.

The Importance of Accuracy.

There is nothing more important than accuracy. I have always made every effort to be accurate in what I did. In my own case I had no special advantages. I had no superior education, no unusual mental gifts, no physical advantages, no influential friends, no money. I was in a rut. I worked my way out of it by trying to do more than was required of me.

I never had a chance, or, if so, I failed to recognize it, to do any unusual or brilliant thing, anything spectacular, such as being the hero in any great railroad accident or situation, or sensationally saving some celebrity's life.

I've simply pegged right along. I have always been an early riser. I believer if you really want to get along, rather than to see how easy a time you can have, you must keep your mind centered on your work and learn the art of concentration.—Daniel Willard, president, Baltimore & Ohio Railroad.

Try to make the subscribers feel that you have a personal interest in each of their calls. This can be done in so many ways. One of the most important means of doing this is through the voice. It is not only the rapidity of her fingers and the accuracy of her speed that makes a good operator. No matter how swift her speed may be, and how accurate, without the pleasant voice the other good accomplishments are valueless.

It is not everyone who has this "sweet voice" but it is possible to gain one through cultivation and training. Without the sunshine voice the very best of service may be called "rotten." Not only does an operator with a cross voice and discourteous manner impair one call which she has answered, but it reflects on all calls that the unlucky subscriber may have that day or few days. It is easy for a subscriber to forget the prompt and courteous service which he is paying for and receives so many, many times, but it is much harder for him to forget the bad service. The voice reflects on the company as well as the rest of the girls and the service as a whole.

We are all well acquainted with the "pass along game," aren't we? You know you smile at Mr. Jones and greet him with a cheery "good morning" and he passes it to someone else, who in turn passes it on and etc. Well, it can be the same with telephone business. You must put the sunshine in your voice, see that it is well modulated; be sure that it is cheerful and sweet, because that is the only way you can start the game.

Now suppose we have learned to unconsciously start this game each morning and we are swift and accurate. Will these factors alone accomplish good service which we are solely working to attain, whereby we can claim the title of a good operator? No.

An operator must sit in the correct position at the switchboard in order to do the best work. If she doesn't sit straight she will soon become tired, and one who is tired is not normal. When we are not working under normal conditions, we can not put forth the effort we should.

Can a good operator pull and jerk the plugs as if they were unbreakable? Can she visit at the board and attend to her duties properly? No. Although we say the work is a pleasure, it should be a pleasure because we are serving others. We say the work is easy. True it is easy, yet I contend that it needs our undivided attention.

To be in the "good class" one must be reliable. We must by our actions make our superiors feel that we can be depended upon. An operator must retain her self possession at all times, under the most trying circumstances. No matter how heavy the traffic may be, she should work just as fast as possible to be accurate.

There is nothing which will influence a new operator as much as the actions of an experienced operator with whom she works. If an inexperienced operator works with an operator who works smoothly throughout the eight hours of a day—one who never becomes excited or cross, one who seems to put her heart and soul into her work—she will envy her to such an extent that she will wish to be like her. Soon the operator unknowingly will begin to follow the example set before her.

A good operator always takes a interest in the training of new operators. Only a very little encouragement helps a great deal. When I began my telephone career I felt as they all usually do. It was a strange place; I was among total strangers and the work seemed very complicated. One operator, who had been with the company for a year or two, encouraged me more than any one. What did she do?

Each morning I received a smile and when it was possible a cheery voice greeted me. I began to expect that smile and it encouraged me. If we happened to meet in the restroom she always said something to encourage me. True, it was only a little thing but it made me long to some day have a part in the work. She was what I called a good operator, and I hoped to be like her.

To be a good operator one must use the proper phrases. The business man or anyone who uses the telephone to any extent forms the wrong impression if the phrases he hears are not uniform. Suppose an operator should answer a subscriber using this phrase, "No sir, I did not ring you and I don't know who did."

If you should hear that phrase, wouldn't

you think, "Well, so that is an example of their training and cooperation they boast of!" Yet you can't blame the girl much if she hasn't been taught any better? We can all readily see who in this case is blamed for the operator's deficiency. The phrases which have been decided and established as the best ones to be used by people who make a specialty along that line, should be used at all times.

An operator should be clean and neat as nothing impresses one more as to the individual's character than the personal appearance. She should avoid wearing gaudy and flashy clothes. They give the appearance of cheapness.

It is much easier to work for ourselves; a greater effort is put forth when we are working in our own business, than when we are employes. That should not, however, be the case. If we would not think of shirking when our personal interests are involved, why shouldn't we be doubly careful with that which belongs to someone else? If others have confidence and faith in us to trust us, should we take advantage of this trust?

There is nothing more valuable in the world than confidence. So let each of us place ourselves as the owners of the telephone company for which we work, knowing ourselves as no one else does, would we trust our business to such employes? Are we all good operators?

If we can be courteous and sweet at all times,
No matter what happens on the lines;
If we are always cheerful and never careless,
And try to increase our speed and accuracy each day;
If we are kind and "day by day, in every way, work better and better"
Then we are good operators.

Plattsburgh District Meeting of New York Up-State Association.

The annual meeting of the northeastern district of the Up-State Telephone Association of New York was held at the headquarters building of the Northern New York Telephone Corp. at Plattsburg, N. Y., on Friday, July 25.

The meeting was largely attended, covers being laid for 85 at the luncheon tendered by the Northern New York Telephone Corp. There were 42 operators in attendance at the operators' school, which was conducted by Miss Marguerite P. Croake, traffic supervisor, of the Northern New York Corp.

The meeting was opened with an address of welcome by President I. H. Griswold of the Northern New York Telephone Corp., who told of some of the more important of the problems of the small companies and also some of the activities of his own organization.

An interesting statement of the association's work was presented by Vice-President and General Manager J. G. Ihmsen, of Albany, illustrated with specific instances of benefits that small companies had received.

Attendants at the Annual Meeting of the Northeastern District of the Up-State Telephone Association of New York at Plattsburgh, July 25, Found Many Things to Interest Them in the New Headquarters Building of the Northern New York Telephone Corp.

General Manager B. H. Brooks of the Northern New York Telephone Corp. and a vice-president of the association acted as chairman of the meeting. Papers were presented and talks made by:

H. C. Barnes, Albany, division toll traffic supervisor, New York Telephone Co.; F. L. Flanigan, Schenectady, district traffic manager, New York Telephone Co.; O. E. Southwick, Champlain, president, Champlain Telephone Co.; Datus Clark, Peru, president, Champlain Valley Telephone Co.; M. W. Hicks, Granville, manager, Granville Telephone Co.; N. H. Harned, Keeseville, manager, Keeseville Telephone Co.

L. E. Croake, general auditor; Henry McConville, general commercial superintendent; I. S. Pendleton, acting traffic superintendent, and Miss M. P. Croake, traffic supervisor of the Northern New York Telephone Corp., took active parts in the program.

A motion picture, "Electrical Transmission of Speech," recently released by the American Telephone & Telegraph Co., was witnessed through the courtesy of R. J. Henry.

The new headquarters building of the Northern New York Telephone Corp., which was described in TELEPHONY of June 7, was thoroughly inspected.

Mirror Helps Operators Cultivate "Voice with a Smile."

The mirror, an age-old aid to beauty, is also used to help to "put a smile in the voice" of telephone operators.

In order to develop voice technique, telephone operators of some Bell companies are taught to practice before a mirror so as to be able to study the action of the mouth, for a girl's voice is always a vital, elusive part of her charm and to the operator it is something more—her telephone personality.

The first objective of voice technique is to make telephone voices uniformly distinct and clear so as to do away with misunderstandings and repetitions. Efficiency, however, is not the only consideration.

Conservation of the voice is necessary to every operator, so that she can use it so skillfully, so sparingly and so quietly as to be able to talk with the least effort, and prevent fatigue. It is at this point that the use of the mirror is invaluable to the operator in acquiring good enuciation and speaking in a pleasing manner.

One of the most important factors in an operator's speech is the use of rising inflection. As the voice rises in pitch, the sound waves in the air become more rapid and more clearly understood. Practice in front of the mirror shows her how to have the voice float out clearly as it goes up.

The Public and Telephone Company

Intelligent Public Opinion Necessary for Solution of Utility Problems— Give Public Underlying Facts Concerning Your Business—Cultivation of Good-will Considered from Public's Viewpoint—Presented at Nebraska Convention

By H. T. Dobbins,
Associate Editor, Nebraska State Journal, Lincoln, Neb.

It is, of course, trite to say that the question of the relations between the public and the telephone company are at the bottom of good service, at all times and everywhere. But no fact has been so thoroughly burned into the brain of every editor as that, before he can hope for any response to the appeals which he makes in the interest of reform in any walk of life, he must keep repeating what he has to say until it has been hammered home and results have accrued.

While the situation in Nebraska is much better than last year, from the standpoint of the telephone companies, and there is very little of the "Bloomfield spirit" among even the militant farmers of the state, that is due about as much to the disinclination of many managers to push the issue of adequate rates as to a betterment in the financial conditions of the farmers.

It is not at all amiss to call your attention to the fact that another campaign is at hand, when the self-seeking politicians will be out trying to ride into office by the familiar route of rousing public prejudices against any business that is serving the people, if only for the purpose of driving home the truth that, if you have been loing a good job of cultivating public favor by proper means, you can afford to laugh at any effort of the politicians to separate you two.

This is what I have in mind, and it is the whole nub of the remarks which I have gathered together under the general title of "The Public and the Telephone Company," that the biggest part of your job of furnishing good service lies in the successful cultivation of public good-will and not upon the number of hours you put in tinkering your switchboards and tapping your pole lines. In what I say, please bear in mind that I am speaking as a part of the public and am not pretending to advise you from the standpoint of a telephone expert, familiar as circumstances have permitted me to be with many of your problems.

Commissioner Randall held a hearing recently up at Bancroft and the method he employed there to drive home to the earnest but protesting farmers the facts about the cost of giving the service over which a controversy prevailed is one I commend to you, in principle, in dealing with patrons who think they are being charged too much.

The company had been furnishing service for years for 25 cents a month, which had been costing nearly twice that amount to give. It was asking for 50 cents, and the farmers flocked in there to object, not because they had any idea whether or not 50 cents was a proper rate but because it was 100 per cent more than they had been paying—and anything like that could not be right.

Mr. Randall called representatives of the farm lines to the front, seated them in the first row and furnished each one with a pencil and a pad of paper. Upon this he caused them to put down each item of the cost of giving switching service that it was agreed was a proper one and known to be what the company was paying to render. Then he had them add the figures, and when they found the total was 42 cents, there was no chance of a disagreement over any facts in the matter.

Mr. Randall did what the manager of the company, as I view it, should have done in advance of the hearing—at least to the extent of his ability—and that was to sit down with the men interested around a table and talk it out with the figures in front of them.

It is not always possible to avoid trouble over rate adjustments, because some communities are afflicted with free-talking men without any sense of fairness as between men and men and who have an infinite capacity for making everybody else angry, on both sides of the discussion, so that an amicable adjustment is not within reach.

Speaking as a member of the public, I want to make the point that telephone managers do not take into account the very great ignorance that the average man possesses with respect to the problems of operation and service that are yours.

When a sleet storm comes along and disorganizes service, he knows that he must wait until you can repair a damage; that he can easily visualize because it is something which his own experiences and observation have made understandable. But beyond that, most of the things which are as familiar to you as the alphabet, are to him mysteries as deep as any the old Greeks ever devised.

If you will stop to reflect how small a proportion of the people who use the telephone every day have other than a vague idea of even the simple operation of making a connection in a manual exchange, you may gain an idea of what a real job is before you to convince a man with a wrong number, for instance, that the chances are about ten to one that a faulty memory or a tangled tongue attached to his person, and not the operator, was responsible. If he knew the precision which an operator acquires in making connections, he would not want to debate the matter with you.

The public needs to know a lot more about the mechanics of your business before you can hope to get a fair break in the argument when one arises over service. Your job is to see that they get better acquainted with them. This is old stuff, I freely admit, but the fact that so many telephone men have failed to see the advantages of this course of conduct justifies the repetition.

I read in the Northwestern Bell magazine the other day a compilation telling of the demonstrations, running into the thousands, that the company has staged in opera houses and other places where it could get subscribers to come by the promise of a good program, how many more thousands had been visitors at the exchanges, and how many silver-tongued orators of the company had appeared at Kiwanis, Lions, Pathfinders, Rotary and chamber of commerce dinners to explain all about it.

If a big organization like that, equipped to give the finest possible service, finds it necessary to expend the large sums it does to establish that relationship with the public which its managers believes to be necessary before they can really boast of good service, it ought to spur every small company magnate to attempt the much smaller task that he has before him.

The average American of today has witnessed during his brief lifetime the appearance of so many marvels in the physical world about him that the miracle of

Why Few Attain Goal of Success.

Success is the goal which most men aim for in life but which few attain. This is mostly due to the natural human weakness to shun the road which requires hard work, tenacity and patience for the short cut in which lie the elements of chance and uncertainty and which usually results in failure.—Henry L. Doherty.

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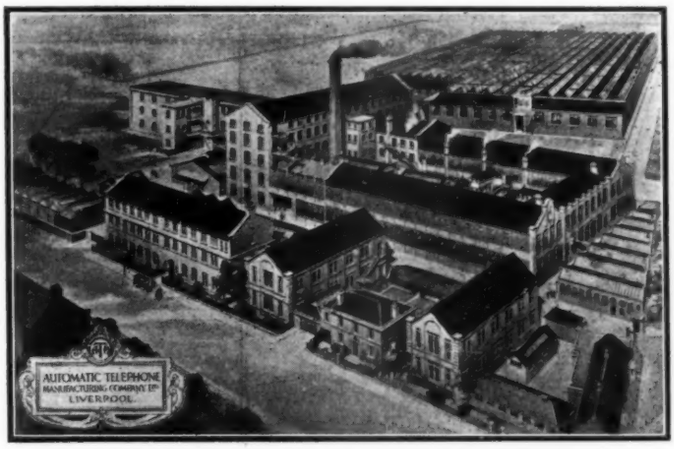


The Liverpool Plant of the Automatic Telephone Mfg. Co., Ltd., where the Tokyo Automatic Telephone equipment will be made

c Company

CHICAGO, ILLINOIS

NIES

.....New York
.....London
.....Liverpool
.....Paris
.....Sydney

the telephone is accepted by him as a matter of course. He is not interested enough in any of them, because they are so many, to undertake a personal investigation for himself. Yet he likes to be told. Why not tell him?

Insofar as the telephone is concerned, the average man is inclined to look upon it as a necessary nuisance. It breaks in on him when he is busy, he fails to get his party because the line is in use; he is roused out of bed to hear of some disaster to his interests or his family, he is called when he isn't wanted—and he blames it all on the company and poisons his idea of service.

He finds out, incidentally, that part of the rate you are collecting from him is for a depreciation account. Thanks to the general ownership of the automobile, what depreciation is is no longer the deep, dark mystery it once was, but there is still room for enlightenment on the particular reason why it is necessary for the telephone company to spread this charge over the life of the property devoted to service.

He notices that the more telephones there are attached to an exchange, the greater the charge per month. This is so contrary to the average experience of men that, without investigation and explanation, it is accepted by him as another example of what he has been taught by the politicians to regard as "corporate greed."

Many men think of the telephone merely as "that box on the wall" for which they are asked to pay rent and go on thinking that in some indefinite way they are being gouged. Isn't it worth while to inform him that service is much more than that and that it is service he is paying for and not for the mere use of the instrument?

I could multiply these instances, but more of them will occur to you than could possibly come within the range of my knowledge. Each of these, by itself, does not amount to much, but the sum total is impressive. Good business judgment and the continuance of the enterprise in which you are interested make it most important for you that you secure an adequate return upon your investment.

If there is any fact that has passed beyond the possibility of dispute, it is that this cannot be assured to you unless your relations with the public are reasonably cordial and based upon a mutual understanding, because service cannot be satisfactory without this condition existing.

It will be readily admitted that this is a hard job. Every utility now in existence is the inheritor of the ill will and prejudice roused in the "public be damned" period of corporate existence, when the corporations employed political power to secure advantageous rates and freedom to freely water their stock.

Every fair-minded member of the great public will admit that this era has passed, that it no longer represents the attitude of corporation managers, and that under regulation both reasonable rates and protection from illegal stock issues are assured. Yet its embers remain, ready to be fanned by demagogic office-seekers, and constitutes an invisible handicap that remains to be leaped with most men who have real or fancied grievances against the utilities.

Good service is the product of a tripartite coöperation, on the part of the company, on the part of its employes and upon the part of the public. The task of securing this coöperation rests entirely with the man who represents the company in an executive capacity. It is the one to which I am calling you.

If I may revert back to the subject of operation, let me suggest that the public little knows how often it is responsible for poor service in a mechanical way. One of the biggest wastes in the business results from the unnecessary calls and the unnecessarily long conversations. Yet the average patron thinks, when he pays his monthly bill, he is free to make as unlimited use of the facilities as he pleases. He is never likely to think that the unit of cost in operation is the call itself.

How many of you have ever taken the trouble to explain how great an interference the indulgence of this freedom is with good service, because it ties up facilities and adds to the number of operators necessary?

If one were to judge from the number of utilities, especially those engaged in furnishing electric current, that are now offering stock in their enterprises to persons who are their customers, one would suppose that customer-ownership is something new. It is not.

It is a form of mutual organization that was followed in most cases when the towns had to undertake telephone development in the early days, because no one company could provide the capital for it at a time when everybody wanted service.

Nevertheless, it is desirable policy for every public utility. At a time when men are acutely interested in getting necessities at a lower price, it is a telling argument if something you have to sell is offered him at cost.

Stock ownership in a utility does give the holder all of the profit attached to furnishing the service for which he pays. If a man is paying $21 a year for telephone service and holds $300 worth of 7 per cent stock, his rentals and his dividends balance. He is not, of course, getting his telephone service for nothing, but it is costing him no more than the sum necessary to give it to him would earn in the average business enterprise.

Customer-ownership has several other

What I Hear in the Dull Hum of the Bee.

By Miss Anne Barnes

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

" . . . A big day for the bees a-swiggin' honey, till they stutter in their buzzin' and stagger as they fly . . . "

This morning, while I was standing by a large group of ragged robins in our backyard, I heard dozens of honey bees buzzing busily as they flitted from flower to flower, gathering honey from the tiny cups. I suppose, if I understood bee language, I might have heard a little song all about sunshine, dewdrops, and rainbow tints. But, instead, in the droning buzz I seemed to hear a message, "Don't come too close or you will get stung."

As I walked back through the grape arbor, the sound of the bees' buzzing still lingered in my ears, and strange to say, seemed to echo something I had heard over in Iowa—something that related to my work out there. What was it?

A walked back to the ragged robin group, leaned quietly forward, and concentrated on the droning sound accented by the number of the little busy bees. Was it imagination, or did I hear through the droning, "Nuplease," "Brpls," "Pls," "Unthrfi," "Totounun," etc.? Try this on your flowers.

While the bees gathered honey, I gathered a lesson from the bees; that my work in Iowa was not done until I had taught my operators to eliminate the mechanical bee droning from their voices, and to speak in the same manner as though face-to-face with their patrons.

Bee-droning voices in telephone operating rooms are not confined to Iowa, for I hear them wherever I use a telephone.

Operators frequently complain that patrons treat them as though they were not human. I wonder if they cannot trace the cause to the bee-droning habit of speaking over the telephone? May not their patrons suspect the sting of indifferent service in their manner of speaking? Think about it.

features to commend it. If a man has an interest in a company, he is very apt to be alert to defend it when it is attacked; and in a day when the utilities are kept so busy on the defensive as not to have time to launch an offensive, this assists in protecting against unjust onslaughts.

If you are faced with the necessity of a rate increase, it is not so difficult to secure because it lessens the number of possible opponents since, if the customer-owner knows nothing about the necessity for a higher rate, he is not concerned because he gains where he loses and loses where he gains.

There is one possible disadvantage; that its effect upon service may be bad. The one thing that has tended to perpetuate public ownership of certain classes of public utilities has been the complacency with which the people accept indifferent service at the hands of the management because they own the works. If they want better service, they must pay a higher rate; and they do not care whether it makes expenses or not because they argue that it can make no difference to them whether they take the money out of the pocket from which they pay rates or out of the pocket from which they pay general taxes.

The fact, however, that it will not be possible to have every customer an owner, in view of the large number of transients even in the smaller communities, leaves a large enough number of critical patrons to insure the best efforts of the management in the furnishing of good service.

If another illustration is needed of the debilitating effects on service of subscriber ownership, let me suggest that you cast your retrospective eye over some of your farm line company connections, where they endure with complacency an intermittent service that would permanently set on edge the nerves of any telephone operating man.

I have often wondered if the loud and raucous voices possessed by so many of the farmers who are in politics, were not developed by the seeming necessity of shouting their messages over their telephone lines. The other day I read a story of a man who was walking down street late at night when he saw another man under the glare of an arc light in apparent search of the ground.

"Lost something?" he questioned as he came up to him.

"I losht me wastch," was the reply from the chap who had looked unwisely upon the 18th amendment.

"What's that?" he asked.

"I shed I losht me wastch."

"That so?" said he, "I'll help you hunt for it. Where do you think you dropped it?"

"On the other shide of the street," came the unexpected reply.

"Well," said he, "if you lost it over there, why are you looking for it over here?"

"Caushe," gravely responded the inebriated one, "lightsch a whole lot better over here."

Many of the men who do our public protesting do it regardless that the facts are across the street because the talking is better where they are.

As a part of the public I have been somewhat astonished at the fact that so many telephone companies are willing to work for nothing. I glanced not long ago over the summary prepared by the state railway commission of the annual reports for 1922 of the 200 some odd companies doing business in the state. This discloses the surprising fact that only one in four of them are paying dividends or earning a sufficient sum to justify such payment.

Perhaps that paragraph is not likely to interest those of you within the sound of my voice, for I have been impressed in the past with the fact that practically all those, who are good enough business men and executives to put their companies on a regular, dividend-paying basis, are smart enough to realize the advantages attaching to attending these annual meetings.

In our business, we do not think very much of the reporters who are willing to work for nothing. The same attitude is taken towards telephone companies by the thinking part of the public, because it knows that it cannot expect and has no right to demand good service from persons who work gratuitously.

In fact, the utility is a servant of the public, just as it is in law. We, the public, may not be able to discharge you if you act saucy towards us, or are careless about whether you serve us well or not, but we have in the state railway commission a rod in pickle that we can use if necessary, but we would rather not.

The public, as an employer, has been derelict, it is true, in not trying to understand the work that you, its employes, are doing. It has relied too much upon its superintendent, the commission, and too often has given the commission a tongue-lashing for the way in which it handled the job when it deserved nothing of the sort and was carrying out the instructions we had set down in the form of law.

Intelligent public opinion is necessary to solve all problems of government; informed public opinion is necessary for proper and prompt dealing with our public utilities' question, if we may punish where we should and reward where we ought.

You have a certain portion of the underlying facts in your possession. Why not share them with the public through the avenues easily accessible to you? Although the fact that the saving grace offered to the sons of men has not produced a converted and perfect world, it has vastly helped the situation. Although the fact that the public may not believe all you tell them about your business, will not bring you perfect peace, it will aid a lot. Try it!

History of the Telephone and Telegraph in Chile.

The fourth in the series of histories of the telephone and telegraph of South American countries, written by Dr. Victor M. Berthold of the American Telephone & Telegraph Co., has recently been published.

This booklet is entitled, "History of the Telephone & Telegraph in Chile." It begins with the introduction in 1851 of the electric telegraph in Chile by William Wheelwright. He was given an exclusive franchise to interconnect the most important cities by telegraph lines.

Several lines were constructed, but the company which he organized was financially unable to carry on the work, so the government decided to undertake the building of a line south of Valparaiso.

This was the beginning of state control and ownership of the telegraph in Chile which still continues. At first it was operated as part of the postal service, but in 1872 a separate department was created. In 1877 the director of telegraphs recommended the acquiring of all domestic and international private telegraph lines. But nothing was done.

Revolutions and political disorders interferred with the development of the telegraph in Chile for a number of years. Statistics for 1920 show the state had 374 offices, railroads 422, and private companies 245. The value of the plant of the private companies was 13 million pesos and that of the state system 7.8 million pesos.

The telephone service in Chile has never been furnished by the government, although at times during revolutions its operation has been taken over by the state or military authorities. From 1891 until the present the government has left the service in the hands of private enterprises operating under franchises.

The first telephones were brought to Chile late in 1879 by J. D. Husbands, an American by birth. He placed six instruments in service in Valparaiso, connected through a central station.

Mr. Husbands promoted several companies, the last of which was the West Coast Telephone Co., which in 1889 was succeeded by the Chili Telephone Co. This company, the largest in Chili, in 1920 had 19,867 subscribers with the National Telephone Co. next with about 2,300 subscribers. In addition to these companies there are seven others supplying public telephone service.

According to the most recent information Chile stands third in telephone development among the countries of South America, having 0.7 telephone per 100 population.

Dr. Berthhold's latest monograph presents in the history of the telegraph and telephone in Chile briefly and concisely the facts as far as they can be accurately ascertained.

Here and There in Telephone Work

Eliminating the Aerial Dip in Cables at Corners.

By Hiram Johnson, *Engineer, Two States Telephone Co., Texarkana, Ark.-Tex.*

For several years, aerial dips have been the popular conception of the best method to avoid bad corners, and there is not a doubt that they do simplify things and

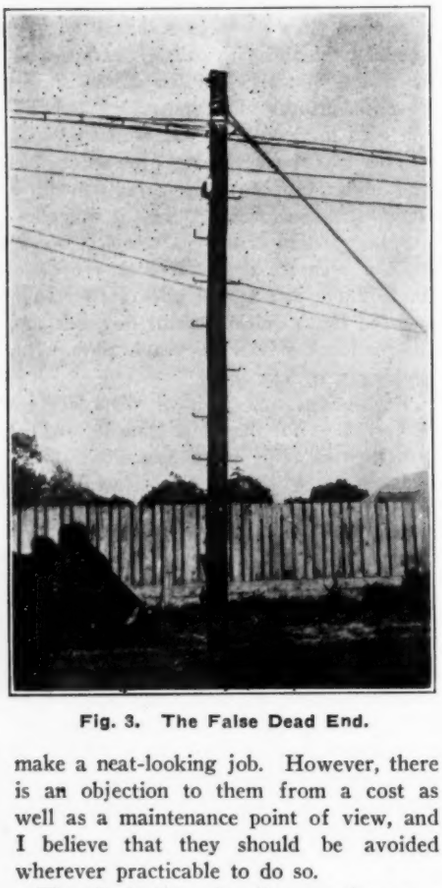


Fig. 3. The False Dead End.

make a neat-looking job. However, there is an objection to them from a cost as well as a maintenance point of view, and I believe that they should be avoided wherever practicable to do so.

The elimination of a dip sometimes presents a serious problem, and its elimination causes the introduction of such an excessive amount of guying that the dip is the least objectionable of the two.

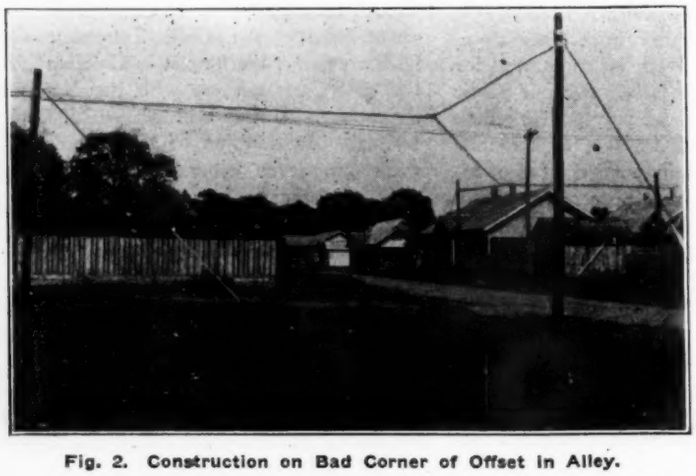


Fig. 2. Construction on Bad Corner of Offset in Alley.

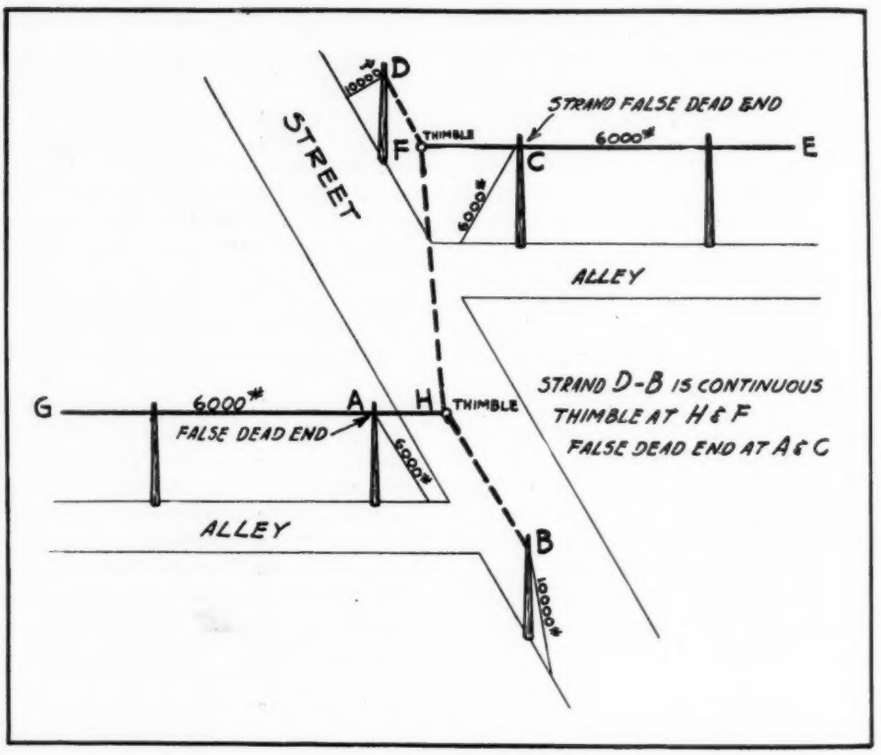


Fig. 1. Diagram Showing Combination of Pull-Off Guy and Slack Span on a Bad Corner.

Dips are often resorted to where there is a decided offset in a street or alley—an offiset which is too great for a pull-off guy to be used.

In a recent construction job we had several very bad offsets in the alleys. These offsets were so great that pull-off guys could not be used, so we experimented. By using a combination of the pull-off guy and slack span, we obtained results which were so satisfactory that we have repeated the experiment in many cases.

The offset in this alley shown in Fig. 1 is about 100 feet and the street about 30 feet from curb to curb. In the first place we set the four poles, *A*, *B*, *C* and *D* and placed an anchor and guy at each one; *B* and *D*, using a 10,000-pound guy to a ¾-inch by 9-foot rod, and at *A* and *C* were placed 6,000-pound guys to ⅝-inch by 8-foot.

The two passengers, *EF* and *GH*, were then placed, using a false dead-end at poles *A* and *C*. A thimble was placed at *F* and *H*. Next, the messenger between poles *B* and *D* was placed, passing through the thimbles at *F* and *H*. In this case, the offset between the two alleys was too great for the messenger to be continuous between *E* and *G* with pull-off guys, *HB* and *DF*,

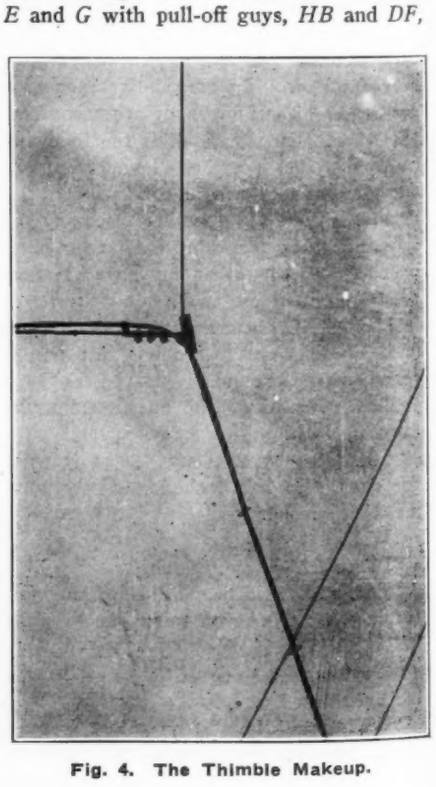


Fig. 4. The Thimble Makeup.

and it looked as though the dip was the only thing.

We tried this method, and the results are pleasing; there is no slack span, although the principle of the slack span is involved, but what might be called a slack span is in reality a pull-off guy.

The largest cable we have used in this type of construction is 100-pair, but even so, I would feel no hesitancy in handling larger cable in the same manner.

Of course, all dips cannot be eliminated and pull-off guys will often be necessary, but in many cases the type of construction just described can be used to advantage, and at a considerable saving of cost. Fig. 2 gives a fair idea of the appearance of the job when completed, while Fig. 3 shows the false dead-end. Fig. 4 shows the thimble makeup.

Italians Honor Meucci as Inventor of Telephone.

Like a face from the grave, the countenance of Antonio Meucci has appeared on the wall of the Public Post and Telephone Office at Florence, Italy, according to a writer in the New York Times. His features in marble are portrayed there on a gleaming new tablet bearing the inscription, "The Inventor of the Telephone —Poor and Defrauded of His Rights."

Meucci's career was one of poverty and misfortune. As a political refugee from his native Italy, he came to America and settled on Staten Island to make pianos and candles. At intervals he became absorbed in working on an invention for transmitting sounds to a distance.

Garibaldi, who fled to America after 1849, is said to have spent hours with Meucci, talking with him from the first floor to the cellar of the little house by means of the instrument his friend and host had devised.

Years of labor on the instrument followed these early crude experiments. But the hopes of all these years were dashed to earth when the president of the New York District Telegraph Co. rejected the designs.

In 1871 Meucci resorted to the Patent Office in Washington. There he filed a caveat, a notice that he was on the track of an invention for which he would later request a patent. Five years afterward the honor of having invented the telephone was publicly awarded to Alexander Graham Bell.

Meucci died in poverty and disappointment. First, however, there were years of lawsuit and the expenditure of thousands of dollars in his behalf. Meucci's gleam was not hidden beneath a bushel. When the telephone, no longer merely a wonder of the lecture platform, had established its business possibilities, the Italian advanced to the footlights.

In April, 1883, the Globe company was incorporated in New York with a paper capital of $10,000,000, its real assets being the pretensions of Antonio Meucci to the invention of the telephone. A few experimental lines were constructed, and steps were taken to organize sub-companies in other states. Then came the suit of the Bell company for infringement of its patent rights.

The depositions of both Meucci, who was then 77 years old, and of his principal witness, past 80, were taken down at great length through an interpreter. Neither spoke English.

While the case was dragging on, Seth R. Beckwith, manager of the Globe company, in which Meucci was listed as engineer, launched the Meucci company in Elizabeth, N. J. There again the Bell company brought suit.

The action of the court in 1887 in deciding against Meucci and Beckwith in the Globe case practically settled the other case also, although it stayed on the docket until January, 1892, when a decree was entered by consent. In the meantime the United States Supreme Court had sustained the Bell patents against attacks made several years before, and the Meucci people in Elizabeth had sold most of their plant to the local Bell company.

During this struggle a research engineer of the Bell company assigned to the study of the Meucci invention, wrote to the company that Meucci's instrument was little more than the string telephone. It was reported as an acoustic apparatus without electrical connections.

When the practicability of the telephone was established, hundreds of Meucci's fellow-countrymen lifted their voices to claim honor and reward for him as the father of the great invention. In at least one corner of the globe, laurels for the honor of inventing the telephone are still contested.

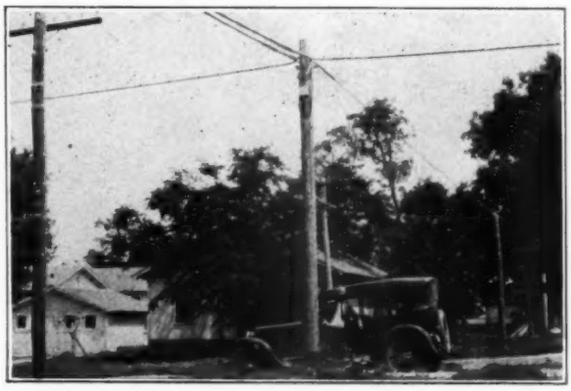
Today, the name of Antonio Meucci scarcely registers a reaction among telephone officials. He is but an indefinite part of a stormy epoch in the struggle for supremacy in the telephone world.

The ghost of Meucci, however, securely laid in the court records of the country of his adoption, stalks abroad in his native land.

Some Real Construction at Sand Springs, Okla.

One telephone man without sleet-storm worries is James Thompson of the Sand Springs (Okla) Telephone Co. His rebuilding job, following the purchase of the Sand Springs property in 1920, is "standing up" as indicated in the accompanying snapshot, which also shows "Jim" himself, the author and finisher of this excellent piece of work.

In addition to the complete rebuilding of the outside plant, the success of the entire undertaking was "topped" with the purchase of a six-position Kellogg universal switchboard which is rendering the highest class of service.



"Jim" Thompson of the Sand Springs (Okla.) Telephone Co. and a Sample of His Excellent Construction Work.

So remarkable has been the response to these improvements that but little "excess" plant remains idle at the present time, while the use of Kellogg harmonic ringing in out-lying districts furnishes the necessary flexibility and insurance against plant exhaustion.

Most important of all is small maintenance and low depreciation of this plant and equipment which results in equal benefit to owner and patrons alike and makes Sand Springs one of the model Independent exchanges of Oklahoma.

Lima Company Elects New Head to Succeed Late D. J. Cable.

Emmett R. Curtin, Lima banker, manufacturer and oil operator, was elected president of the Lima Telephone & Telegraph Co., at the quarterly meeting of the organization held recently in Lima, Ohio. He succeeds D. J. Cable, who died a short time ago. Mr. Curtin has been vice-president of the company and a member of the board of directors and executive committee.

A. D. MacDonell, who has been second vice-president, was moved up to vice-president.

George H. Metheany, general manager of the company, was named as a member of the executive committee.

The office of second vice-president was abolished. This office was created during the prolonged illness of the late S. S. Wheeler who was vice-president, in order that an active vice-president would be available.

A quarterly dividend of 2 per cent on the common stock was declared.

General Manager Metheany submitted a report showing great strides in recent months in the matter of expansion and improvements, especially in underground conduit work. The company has now practically all of its wires underground in the downtown section and a great many of the outlying districts.

Modern Exchange at Franklin, Pa.

Petroleum Telephone Co. Cuts Over New Stromberg-Carlson Superservice Switchboard Installed in Fine Brick Building at Franklin, Pa. — Description of Building and Equipment, of Which General Manager Paca Is Very Proud

Franklin, Pa., now has one of the most modern and complete telephone exchanges of any city of its size throughout the country, the Petroleum Telephone Co. having recently cut into service its new Stromberg-Carlson superservice switchboard, housed in a splendid new exchange building.

W. S. Paca, of Oil City, Pa., secretary and general manager of the Petroleum Telephone Co., is exceedingly proud of the new exchange. "I believe I can honestly say that the Franklin office and equipment will compare very favorably with the most modern plant of its size anywhere today," is Mr. Paca's comment upon the newly-completed exchange.

About 3,000 subscriber stations are operated by the Petroleum company in Franklin, a city of about 10,000 population, and the immediate vicinity. The new board, with an ultimate capacity of 2,000 lines, is designed to provide for the city's growth for some years to come.

"Open house" was observed in the Franklin exchange several days after the cut-over to the new equipment the latter part of June. A large number of local residents, as well as some visitors from Oil City and other nearby communities, availed themselves of the opportunity of inspecting the new exchange.

Employes of the company were on hand to show the visitors through every part of the building, from the basement to the second floor. The most interesting part of the structure to most of the callers was the operating room, where they had an opportunity of seeing the operators at work and to learn just what happens when they take down the receiver and put in a call for another subscriber.

The new exchange building, a photograph of which is reproduced on another page, is up-to-date in every respect. The construction throughout is of brick, stone and steel, and the result is a structure which is as handsome as it is convenient and practical. In the basement is located the battery room, which is finished with an acid-proof enamel paint. The design of the room is original with the officials of the Petroleum company and has attracted telephone officials from other cities, to inspect it.

General Manager Paca Is Very Proud of New Franklin Exchange.

Two sets of batteries are provided, so that if anything should go wrong with one, the other can be instantly cut into use. Some of the electricity used in the building is obtained from the city lines and some is generated by the equipment in the exchange building. The generators can be operated by gas, oil or electricity, preparations having been made to care for any emergency which might arise.

A neat boiler room is also in the basement, with a small room for the storage of coal. The furnace used in heating the building can be changed in a few moments so that either coal or gas may be used.

The main floor of the building is occupied as the business offices of the company, including the office of Manager Geo. W. Wiseman, the wire chief's office and the wire chief's room. Telephone booths are provided in the lobby.

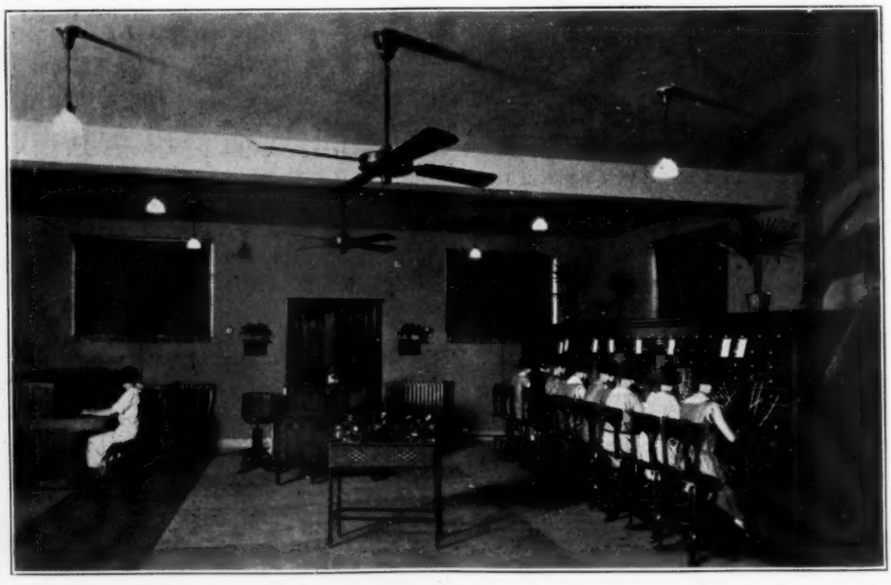
On the second floor is the operating room, with the new switchboard. There are positions at the board now for nine operators, and another section has been ordered to take care of the additional traffic when the Petroleum company takes over the local Bell exchange.

The operating room is spacious and well ventilated, two large ceiling fans keeping the air in constant circulation when needed, and places have been provided for other fans if it is found necessary to use them. The diffused lighting system in the room is comforting to the eyes, and makes the lights on the switchboard more visible.

A restroom and kitchenette have been provided for the use of the operators when off duty. The restroom is comfortably furnished with wicker furniture, and a telephone is provided so that the girls may do any calling they desire when they are not on duty.

The kitchenette is equipped with a kitchen cabinet, a range, sink and other necessities of a kitchen so that the girls may prepare their meals in the building in inclement weather or when it is not convenient for them to go home at meal time. Nothing has been left undone that will tend to add to the comfort of the girls.

The plans for the building, although assembled, of course, by ar-



Operating Room of New Franklin Exchange Showing Stromberg-Carlson Superservice Switchboard in Service.

chitects, were made by officials of the company. The building has been so constructed that if ever necessary several additional stories can be built onto it, and the company owns sufficient land on each side so that no other buildings may be built up against it. The exchange is fireproof throughout and is substantially constructed.

One of the features of the new exchange which is certain to find favor with subscribers in Oil City and Titusville, as well as Franklin, is the installation of additional trunk lines between these places. The number of lines has been practically doubled, thus insuring much better service between the cities.

New Exchange Building of Petroleum Telephone Co. at Franklin, Pa.

The new features of the switchboard installed in the Franklin exchange are best described in a booklet sent out to the company's patrons by General Manager W. S. Paca, telling of the new equipment to be cut into service and inviting them to visit the exchange on the day designated as "open house" day.

"We believe you have been receiving good telephone service," says Mr. Paca in this booklet, "but you are going to receive better telephone service.

"In the selection and purchase of the new exchange equipment we have spared neither effort nor expense to obtain the most modern type, incorporating every service-bettering feature of tried and proved worth in the telephone field.

At the old central office your call came to but one operator. On the new switchboard your call lamp will appear before at least two operators. This means, to you, faster service. It means faster service because it doubles the number of operators available to serve you in answering your call.

Other features on our new switchboard which are going to improve our service to you and with which you therefore should be familiar, are briefly described in the following paragraphs, and you are requested to read carefully the detailed description, so that you will understand something about the operation of the switchboard, especially the new ringing system.

Operator's Cut-in gives you instantaneous contact with the operator, the moment she plugs up to answer your call. It eliminates the necessity of the operator's throwing a listening key and it disconnects the operator from your talking circuit automatically—the instant that she starts ringing the party whom you have called.

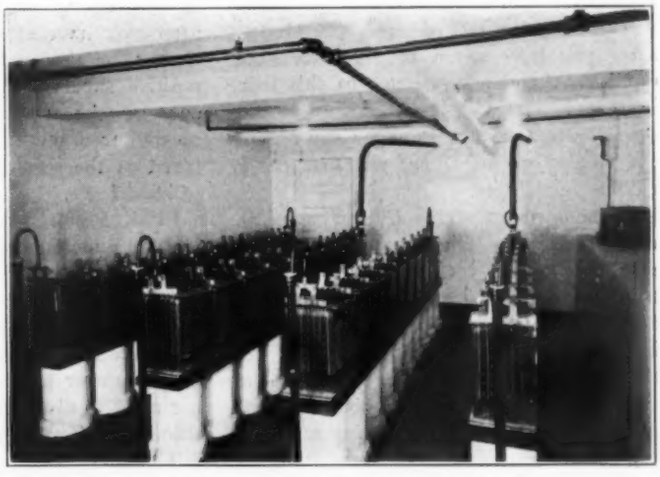
Operator's Bar makes it impossible for more than one operator to answer your call.

Advance Plugging-in speeds up service because it gives your operator the opportunity to plug up your call while she is getting another subscriber's number. In other words, it is not essential for the operator to hesitate in answering your call, until she has completed her work on a previous call.

This feature permits your operator to speed up service because it provides for the mechanical operation of placing a plug in connection with your talking circuit, while the operator is using her talking apparatus to obtain the number from the party who immediately preceded you with a call.

Operator's Answering Indication is one of the features which makes it possible to answer without keys. It also shows the operator instantly—at all times—upon which cord circuit her talking set is connected. This gives the operator an opportunity to serve you quicker than is possible with older types of switchboards. This operator's listening indication also makes it impossible for an operator to overlook completing your connection after she has once plugged up your call.

A Glimpse of the Wirechief's Department, Power Board and Main Frame.



In the Battery Room in Basement, Two Sets of Storage Batteries Are Provided.

Operator's Secret Service prevents the operator from either talking or listening in on an established connection. It helps to speed up service not only because the operator cannot lose time listening to conversations, but also because the operator cannot hear conversations which would likely distract her attention from her work.

Audible Busy Test guards against connecting you with a busy line. It functions by giving to the operator a distinctive series of clicks in her ear when she tests the thimble of the jack which is associated with the instrument of the party whom you are endeavoring to call.

New Operator's Ringing Control starts the ringing of the party whom you are calling the instant your operator pushes the proper ringing button. It is a feature which simplifies telephone practice, on account of the fact, that only four ringing buttons are required in front of an operator's position, instead of the 60 or 80 ringing buttons which were required on older types of switchboards.

The elimination of so many ringing buttons before the operator, speeds up service by permitting the use of fast touch methods of ringing button location, in place of the slow sight methods that obviously were essential on older switchboards, which fairly bristled with ringing buttons. This feature also is arranged so that it is impossible for the operator to start the ringing on a line which is being used in conversation.

New Machine Ringing continues the ringing of your party independently of the operator after the ringing once has been started. This saves the operator much supervising time. Furthermore, this feature's method of regularly and intermittently ringing the called party hurries the answer of the party whom you call, because that party knows his bell will ring continuously until the call is either answered by him or abandoned by you.

New Ringing Tone informs you that the operator is ringing your party. You are informed that she is ringing by a distinctly pleasing and uniform tone which you hear in your receiver immediately after you have given the operator your number. Another advantage of this tone, is that it makes it unnecessary for the operator to lose time in either supervising the ringing or informing you that she is calling your party.

Instantaneous Ringing Cut-off stops the ringing of your telephone's bell the instant you answer your call. You will like this feature because it makes it impossible for the operator to ring you in the ear. Furthermore, it makes it impossible for the operator to injure your telephone instrument by permitting the heavy ringing current to flow through its delicate talking parts.

Calling Subscriber's Ringing Control discontinues the ringing of your party the instant you hang up. When you hang up before the party you were calling answers, you light disconnect lamps before your operator. These lamps inform her that you have abandoned the call.

Reverting Call Ringing assists you to call parties on your line. It is arranged so that if you will follow the instructions given to you by us, you will have no trouble whatever in talking with parties on your own line.

Dark Keyboard limits the number of signals burning before your operator to only those which mean action on her part.

This feature derives its name from the fact that both of the supervisory lamps used in the connecting circuit between your line and the line of the party whom you call are darkened the instant the operator has started the ringing on your connection.

This method is in contrast with that employed on older types of switchboards which were made before the advent of the dark keyboard feature. In those switchboards one other lamp which was known as the calling supervisory lamp remained lighted during the period when the operator was ringing the called party. Our new switchboard eliminates this unessential lamp; by so doing, the confusion which was prevalent in those switchboards from unnecessary signals before the operator is avoided.

Positive Supervision is a feature which informs your operator, by means of signals, as to just what steps she is to take on your connection. This feature gives a distinctive signal for each move on the part of your operator, not only while she is establishing your connection but also after you have completed your conversation. The thoroughness with which this positive supervision is carried out in our new switchboard will be known to you in the accuracy of the service and the speed of the service which you are about to experience.

Flash Recall derives its name because it is a quick method of attracting your operator's attention to your connection when you desire, either to give her further instructions regarding the call which you have just started or to give her another number before she has had an opportunity to disconnect you from the party whom you had previously called.

This flash recall, as the name implies, intermittently flashes a lamp before your operator. It performs the same function that you accomplish on our present switchboard by repeatedly moving your hookswitch up and down. The advent of the flash recall makes it necessary to depress your hookswitch but once. After that the apparatus at the central office will flash the lamp regularly before your operator until she listens in to learn your further requirements.

Call Registration tends to eliminate slow operators by showing the value of each operator to the management. This feature registers the number of calls answered by each operator and, therefore, tends to produce fast service.

Emergency Ringing prevents interruptions in your telephone service by supplying a means of ringing the various subscribers' telephone bells, even though the regular source of power from the city lighting circuit is temporarily disabled. With this emergency ringing feature the operator can ring the parties you call, even when power is cut off from our exchange apparatus, by means of energy derived from storage batteries which we maintain at the central office."

The Business of a Utility.

The business of a public utility is threefold: First, to serve efficiently. Second, to keep and increase the business. Third, to secure the absolute good will of those served.—Bulletin of North Dakota Railroad Commission.

With the completion of the Franklin exchange, the Petroleum company now owns all of the buildings in which its exchanges are located. A total of about 9,600 telephones are operated by the company from its five exchanges, namely, Oil City, Clintonville, Franklin, Pleasantville and Titusville.

An agreement has been made by the Petroleum Telephone Co. and the Bell Telephone Co. of Pennsylvania, subject to the approval of the state and Interstate Commerce commissions, under which the Independent company will take over all of the Bell properties in its territory.

Under the terms of the agreement the Bell company will withdraw from the furnishing of local service in the area now served by the Petroleum company and the Petroleum company will discontinue the furnishing of toll service between its territory and other territories.

With the elimination of competition in its territory, the Petroleum Telephone Co. will be in position to bend all of its efforts toward giving satisfactory telephone service to that area and keeping pace with the increasing demand for service.

Mr. Paca, secretary and general manager of the Petroleum company, is proud of the new Franklin exchange and rightfully so. He has successfully directed the destinies of his company for many years and the system is now in a healthy and prosperous condition.

He was born in the state of Maryland, August 27, 1863, a great grandson of William Paca, a signer of the Declaration of Independence and first federal governor of Maryland. His early life was spent on a farm and then he entered the telephone business, in the employ of the Bell company at Baltimore, Md. Three years later

he went with the Viaduct Mfg. Co., of that city.

During 1886 he was engaged in special engineering work on the first electrical street railway in the United States and also conducted tests on long distance telephone lines between Baltimore, Washington, New York and other large cities. Mr. Paca went with the Chesapeake & Potomac Telephone Co. in 1887, remaining until 1894, when he engaged in general electrical construction work. He entered the Independent telephone field in 1896, engineering the construction of plants in Baltimore, Jersey City and in other communities.

Mr. Paca has for years been active in association work in the state of Pennsylvania and is at the present time a member of the executive committee of the Pennsylvania State Telephone & Traffic Association.

No Criticism for Association's Toll Reference and Text Book.

"We have examined the Toll Reference and Text Book carefully and can offer no criticism. It checks with the routine which we are following, the A. T. & T. No. 10. The arrangement of your book is splendid and for quick and ready reference it is unique," writes C. G. Vickery, traffic superintendent, Rochester Telephone Corp., Rochester, N. Y., to the United States Independent Telephone Association regarding its new Toll Reference and Text Book.

Successful District Meetings Held at Heavener and Durant, Okla.

District telephone meetings for the second and third districts were held recently at Heavener and Durant, Okla. Fifty-six telephone people attended the Heavener meeting, July 23. The meeting was held in the Methodist Church and proved very profitable to all who attended.

Late in the afternoon the telephone people attended a picnic and fish-fry on Morris Creek, at which L. E. Thrasher and L. E. Carmichael, owners and managers of the Oklahoma-Arkansas Telephone Co., operating at Heavener, Poteau, Wister and Howe, acted as hosts.. They also gaves the delegates and guests a free noonday luncheon at the Heavener cafe.

McAlester was chosen as the place for the 1925 meeting in the second district. E. K. Cross, Muskogee, manager of the Braggs Telephone Co., was elected district chairman, and Joe Higgins, manager, Southwestern Bell Telephone Co. at McAlester, was elected district secretary for the ensuing year.

The attendance at Durant was not up to expectations, only 28 telephone people being present. The meeting, however, made up in interest what it lacked in attendance. L. E. Davis, of Millcreek, manager of the National Telephone Co., acted as chairman and gave every telephone man and woman present an opportunity to talk about their problems. Practically everyone improved the opportunity, which resulted in the best round table discussion that has yet developed in any of the district telephone meetings.

It was decided to hold the 1925 meeting for the third district at Sulphur and to have a two-day meeting, a part of the time to be set aside for entertainment, bathing and other amusements.

Four more district telephone meetings are to be held during the month of October at various points in the state.

Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchise, Rates and Service

Illinois Bell Wins Case; Peoria Telephone Rates Hold.

The petition of the Illinois Bell Telephone Co. for an interlocutory injunction restraining the Illinois Commerce Commission from interfering with telephone rate raises in Peoria and vicinity, was allowed on July 30 by the United States stautory court which convened at Peoria.

The injunction of the court was ordered to be issued at once and was directed against the commerce commission, the state attorney general, the 15,800 subscribers of the telephone exchange in Peoria and all other parties interested.

It restrains all from bringing any action to defeat the rate increase promulgated by the telephone company July 1, which raised rates to telephone subscribers in Peoria and vicinity practically 25 per cent.

The one point reserved to the benefit of the city is the express provision that the telephone company shall not put any rates in excess of those on file with the commerce commission in rate schedule No. 2, which are those now being charged.

The court indicated that final hearing of the merits of the case to determine the permanency of the injunction would be held some time in September or Octobr. Until that time the rate raise will stand.

Decision of the court was based upon the finding that the rates in effect prior to July 1, known as rate schedule No. 1, were confiscatory and did not allow the telephone company a fair return upon its investment in the Peoria telephone property.

Massachusetts Supreme Court Refuses Injunction Against Rates.

The Massachusetts Supreme Court on July 30 denied the petition of Mayor Curley, of Boston, for an injunction to restrain the New England Telephone & Telegraph Co. from putting into effect two temporary increases of rates allowed by the public utilities commission on July 17.

Judge Wait said the statute gave the commissioners discretionary powers, and the responsibility of exercising such powers was with the commission, not with the court.

Injunction Issued by Federal Court in Washington Case.

On July 21 the United States district court for the western district of Washington, southern division, consisting of Judge W. B. Gilbert, Frank H. Rudkin and Jeremiah J. Neterer, sitting en banc at Tacoma, Wash., issued an injunction allowing the Pacific Telephone & Telegraph Co. and the Home Telephone Co. of Spokane to put into effect increased rates in Seattle, Tacoma and Spokane and restraining the state of Washington from interfering with them, pending final determination of the case. Each company is required to file a bond of $175,000 to safeguard the subscribers.

The opinion of the court given by Judge Neterer follows:

"The majority of the court, as constituted, are inclined to the view that upon the record in each case it is made to appear that the return to the plaintiff is unfair and that from such showing, in all probability, the litigation will result in an increase of the present rates and have adopted the view of the circuit court in Northwest Bell Telephone Co. versus Hilton, 272 Fed. 384, appreciating that if the rates are finally increased the plaintiff will be irreparably injured, if the injunction is denied, and if the rates are not increased the subscribers can be protected by a bond requiring the repayment of any excess of rates collected over the rates as finally determined.

"Pursuant to such conclusion, you may prepare orders in each of the cases enjoining the defendants as prayed, pending the final determination of the case, such orders to be effective upon the plaintiff company giving a bond in the sum of $175,000 in each case, the order to contain appropriate provision for safeguarding the interests of the defendants and subscribers' phone service, and for the appointment of a special master at plaintiff's cost to ascer-

tain the damage, if any, to the defendants and subscribers if judgment is finally entered against plaintiff; the plaintiff to file with the clerk of this court conveniently after the first day of each month a statement of the amount collected from each of its subscribers, together with a statement of the amount that would have been collected had this order not been entered, to the end that speedy determination may be had at the conclusion of this trial should the prayer of the plaintiff be denied.

"The orders may be presented at Seattle, and the bond, if a surety bond, may be approved by the clerk of this court."

Rate Increase Necessitated by Civic Improvements Approved.

The Mountain States Telephone & Telegraph Co. was recently granted an increase in rates at Aguilar, Colo., because of an increase in investments being necessitated by civic improvements.

The commission found that the mayor and board of trustees of the town had notified the company that the town desired to make certain improvements, including ornamental lighting for the main street, and requested the company to remove its telephone poles, wires and fixtures from that street in order to permit the improvements to be made.

The removal of such equipment by the telephone company, the commission found, would cost approximately $7,000 and would require an additional investment of about $4,000 in the exchange investment, or approximately 60 per cent of the entire exchange investment in the town.

Following is the new schedule of rates as approved by the commission to which practically all of the subscribers had agreed:

Business, individual line, $4.50 per month; two-party business, $3.50; residence, individual line, $2.50; four-party residence, $2. The old rates were, respectively, $3, $2.50, $2 and $1.50.

Illinois Company Sues Leaders in Boycott Attempt.

The Carroll County Independent Telephone Co., of Savanna, Ill., has filed suit against Willis Stage, Joseph Melendy, Hiram Green and Frank Brown, of Carroll county, in the circuit court at Mt. Carroll, charging them with conspiracy to injure the business of the plaintiff. Damages in the sum of $10,000 are demanded.

It is charged that the four defendants were instrumental in circulating petitions among the subscribers of the telephone company demanding county rights without the extra charge authorized by the Illinois Commerce Commission. The company alleges the four men named in the suit were leaders in an attempt to boycott the company and that as a result many subscribers were induced to sign petitions agreeing to remove their telephones if county rights were not granted to them.

As a result of the petition, 25 telephones have been removed from the vicinity of the hamlet of Argo-Fa and similar petitions are being circulated in Thompson. It is reported that nearly 175 subscribers have signed the Argo-Fa petition, and that of this number 28 have already removed their telephones.

Telephone company officials declare the suit will be pushed to the limit against the four men. They also assert that criminal charges will be made against persons who are found agitating the further spread of the alleged boycott.

"The Carroll County Independent Telephone Co. is the only one in the state, so far as we know, where county rights are granted at all," said Manager Allen, of the company. "In most other counties," he said, "there is a straight toll charge every time a subscriber wishes service out of the local exchange. Here our subscribers are given a choice of paying the toll charge or securing this service over the year at a monthly rate. It rests with the subscriber which service he wants.

"The state utility commission authorized the rate we are to charge for this county rights, as it is called, and it took this charge into account when it fixed our other rates. To renounce the county rights would be equivalent to reducing our rates and we cannot reduce our rates and continue to give reasonable service."

Abandonment of Exchange, Approved by Idaho Commission.

The Mountain States Telephone & Telegraph Co. on July 3, was given permission by the Idaho Public Utilities Commission to discontinue its telephone exchange at Bellevue and to serve its subscribers at Bellevue through its exchange at Hailey.

The revenues at the Bellevue exchange for 1923, amounted to $1,446.50 and the operating expenses for rent, light, heat, and operators' salaries, exclusive of depreciation charges, maintenance charges and taxes amounted to $2,076. The annual fixed office expenses were, therefore, $629.50 in excess of all revenues credited to the exchange in 1923.

In order to prevent further losses, the Mountain States company asked to abandon the Bellevue exchange and serve the subscribers from its exchange at Hailey, which is about five miles distant. The rate at Bellevue for individual telephones was $3.50 a month, and for two-party lines. $3.00 a month. There was also a toll charge on all calls between Bellevue and Hailey of 5 cents for the first 5 minutes.

Under the arrangement as petitioned for, the rate on business telephones would be $3.00 and for other telephones, $2.00 with no toll charge on messages to Bellevue from Hailey. The change would cost approximately $2,000, but would eliminate an item of annual expense of approximately $2,000, which could be reflected in the reduction of exchange service charges and the elimination of the toll charge. It, therefore, appeared to the commission that the change would result in rendering a cheaper and more advantageous service to the subscribers at Bellevue than they now have, and the company's petition was allowed.

Denies Greatly Increased Rates as Company Knew Conditions.

The Nebraska State Railway Commission holds that the Northwestern Bell Telephone Co. bought the exchanges at Belmont and Whitney with its eyes open and denies the request of the company to greatly increase the rates. These were two of the exchanges taken over by the Bell when it bought the system established by the Wyoming & Nebraska company.

The commission says the location of the exchanges at these two towns was a mistake, and that the subscribers at both points should have been served on party lines from Crawford and have been placed within a zone carrying common rates with Crawford and common service territory.

"Not all telephone exchanges within a system can be operated at a profit," says the commission. "Population distribution sometimes presents insuperable obstacles to profitable operation with a very limited sphere. There are mistakes in judgment in the location of exchanges and assumptions of future growth that do not materialize.

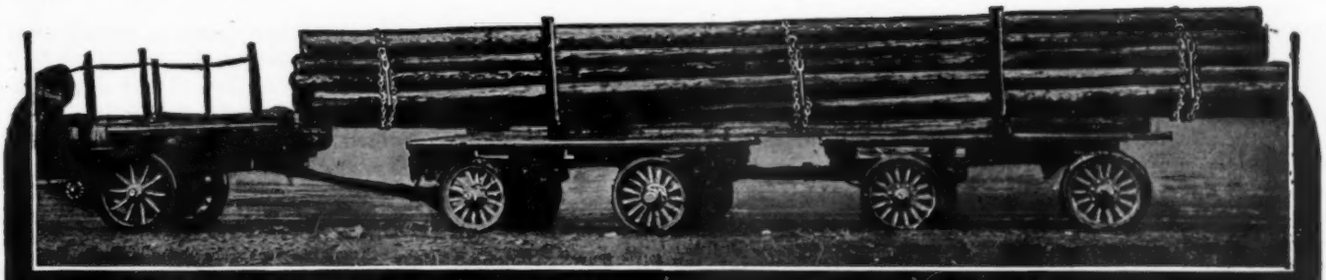
"Undoubtedly each exchange should be self-supporting, if that can be accomplished within the realm of reasonable rates. It is obvious that both of these exchanges are too small to be operated a profit, either by this company or by any company, except they were organized on a mutual basis."

Whitney has 69 subscribers, of whom nine take business service, 13 residence service, 16 farm service over lines owned by the company and 31 receive switching service only. Belmont has one business and one residence subscriber and switches 48 patrons of Independent lines.

The company asked to increase the business rate at Belmont from $3 to $6, residence from $1.75 to $3, and switching from $6.20 a year to $24. The objectors relied largely on a contract with the old company.

The commission says that these contracts have all been superseded by state regulation. It holds that the rates applied for at Belmont are higher than the traffic will bear, and the proposed service station rates are almost three times as high as the highest present service station rates outside of the Omaha territory.

The commission says that the Bell is faced by the consequences of mistakes



Bind Your Telephone Poles With Stacy Load Binders

MR. EUGENE C. STACY,
Tiffin, Ohio.

Dear Sir:—I will state the question of using the Load Binder, as described in your circular, was taken up at our Accident Prevention Committee Meeting and everybody agreed that they were O. K., and instructions have been issued to order as many as necessary.

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If you have not received any orders direct, you will probably receive same from the Western Electric Company, as all of our material is ordered through them.

Yours very truly,
(Name on request)
Dist. Superintendent of Plant.

Telephone companies find Stacy Load Binders big time and labor savers—also a big factor in preventing serious and expensive accidents caused by loads slipping. You simply pass chain around load—hook the ends of the Stacy Binder in links of chain—one pull of the handle and load is bound securely and safely—one man can bind any load in a jiffy.

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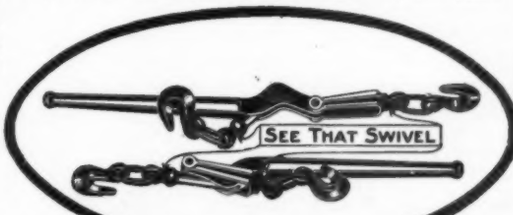
Tiffin, Ohio



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of management in construction, mistakes which it inherited with the purchase, and of which its experts were cognizant at the time. The commission cannot, even if the prayer of the applicant was for such a remedy, authorize or order correction of the error, because applicant has not complied with the statutory requirement preliminary to abandonment of exchanges.

The best the commission can do, it adds, is to authorize the company to publish and charge beginning not later than September 1, rates for exchange service, regular and supplemental, at Belmont and Whitney, the same as those now charged subscribers for equivalent service on the Crawford exchange. These rates are $3.75 net for business, $2.25 for residence and $7.20 for switching.

The commission also gives free service to the three towns, and makes no concealment of its hope that this will be the starting point for negotiations by which the original error can be corrected and the zone service given.

The testimony of the company was that its revenue in 1923 at Whitney for exchange service were $1,198.42 and that its expenses were $1,640.68, leaving a deficit of $442.24 without any return on its investment of $6,760.90.

Appointment of Special Master in New York Rate Case.

Application of the New York Telephone Co. for the appointment of a special master to take testimony and report to the court for an increased rate that would yield an additional annual income of about $7,500,000, was made July 29 before Federal Judge Knox in New York City. The New York Public Service Commission and the attorney general did not oppose it. New York City, through Assistant Corporation Counsel M. M. Fertig, asked for delay, saying that the city might decide to carry the matter to the United States Supreme Court. Therefore, he thought the appointment of a master should be delayed.

Judge Knox allowed the counsel one week in which to submit a memoranda as to the appointment of a master at this time. He told the lawyers that he would accept no suggestions as to who the master would be.

Seek Approval for Purchase of Competing Companies.

Application has been made to the New York Public Service Commission for approval of the purchase by the Delaware Telephone Co., Inc., of Walton, Delaware county, of the property and franchises of the Walton People's Telephone Co., of Walton, organized in 1907, and the Downsville Telephone Co., of Downsville, organized in 1906. Possession was to have been given January 1 and it is asked that the transfer be treated as of that date.

The petition shows that the officers of the three petitioning companies are in general the same, and the stock of the three companies is largely held by the same parties. The Delaware company has 12 stockholders, some of whom own 155 or 300 shares of the Walton company's stock and 620 or 1,000 shares of the Downsville company's stock.

One management will be more economical and practical, the territory served by each being largely rural, the petition claims. The territory served by the Downsville company is traversed by toll lines of the Walton People's company, causing an overlapping in the matter of maintenance and care of trouble.

Another advantage will be an increase in the income of these companies, making possible a uniform rate throughout the entire territory, it is claimed. The companies serve the towns of Walton, Tompkins, Hamden, Colchester and a part of Hancock in Delaware county, and parts of the towns of Rockland and Freemont in Sullivan county.

Pennsylvania Commission Approves Agreement on Bell Rates.

The Bell Telephone Co. of Pennsylvania in an order issued by the Pennsylvania Public Service Commission on July 22 is directed to modify its tariff schedules under the terms of the agreement reached at the conference between counsel for the 38 complaining municipalities, corporations and individuals and the Bell company on July 8. The adjusted rates will set aside most of the schedules which have been effective since May 1 and will save the telephone consumers of the state approximately $570,000 a year.

Reduced rates in Pittsburgh and Philadelphia and restoration of apartment house service is to be made as of July 1, while 14-cent toll charges are to be increased to 15 cents August 20 and the reductions in connecting charges are made effective August 1. September 1 is the date set for the decrease in the charges for private branch exchanges, and all new directories are to re-establish the free listing system used before the May 1 tariff established a charge for all listings over one.

The complaints are dismissed without prejudice to any rights of the complainants which will be guarded by the commission in any proceedings that may be found necessary where purely local conditions have not been met by the adjustment.

No Power to Change Exchange's Location; Rates Increased.

The Washington Department of Public Works in ruling upon the application of the Pacific Telephone & Telegraph Co. for an increase in rates at Kelso and Longview, held that so long as the utility furnished good service at a proper rate, the commission was not concerned in the location of its exchange and was without power or authority legally to interfere with the company's present arrangements as to the locations of its exchanges.

The city of Kelso had protested against the proposed increased rates for the reason that it called for the removal of the exchange from Kelso to Longview. Following is the new rate schedule for desk sets as approved by the department:

Unlimited business, individual line, $4.25, two-party line, $3.50, extension, with or without bell, $1, suburban service, 10-party line, $3.75; unlimited residence service, individual line, $3, two-party line, $2.50, four party line, $2.25, extension without bell, 75 cents, with bell, $1, suburban service, 10-party line, $3.25; the rate for wall telephones being 25 cents less per month than for desk telephones.

Kelso and Longview are contiguous cities situated along the Cowlitz river, Kelso having a population of about 7,000 and Longview about 3,700. A telephone system had been constructed in Kelso and vicinity which was purchased about October 1, 1922, by the Pacific company. The exchange was located in Kelso. Service was rendered to Longview and vicinity from the Kelso exchange at Kelso rates plus a mileage charge, there being no exchange in Longview. The city of Kelso claimed that because it was the larger city and because the proposed exchange would be located away from the center of population, the exchange was not properly located and should be in Kelso, and that with an exchange in Longview there should also be one in Kelso.

The commission found that the first thing of importance was that the service should be efficient, and that the rates should be as low as possible consistent with good service; that if the exchange were so situated as to render efficient service and so as not to impose an extra financial burden upon the utility which would be transferred to patrons, then the commission should not interfere with the utility in carrying on its own business.

The commission further found that a new exchange had already been established in Longview and improvements made at an expense of about $100,000; that service had been furnished from the new exchange from May 17, 1924; that the new exchange was not far from the geographical center of the two communities, but was somewhat closer to the center of Longview than of Kelso; that the maintenance of two exchanges would be wasteful under the circumstances and would impose an extra burden for operation and maintenance which would have to be passed on to the patrons; that the present arrangement as adopted and carried out by the company seemed to make for efficiency, improvement in service and economy of administration.

Rate Increase Is Approved for Grantsburg, Wis., Exchange.

The Wisconsin Telephone Co. was recently authorized by the Wisconsin Railroad Commission to increase its rates for telephone service at Grantsburg, an exchange serving 206 towns and rural subscribers and furnishing switching service to 488 subscribers on rural lines.

The following schedule supersedes the old rates of $1.75 per month for one-party business service; $1.25 for residence; $1.50 for rural and 25 cents for switching service:

	Net Rate Per Month
One party business unlimited	$3.00
Two party business unlimited	2.50
Business extension telephone	1.00
Plus 40c per month for each one-eighth mile line or fraction thereof on stations located outside premises	
One party residence unlimited	2.00
Two party residence unlimited	1.75
Four party residence divided, ringing unlimited	1.50
Residence extension telephone, wall desk set	.75
Plus 40c per month for each one-eighth mile line or fraction thereof on stations located outside premises.	
Rural rates for subscribers connected with rural line	2.00
Within six miles from central office with $3.00 per annum additional for each mile or fraction thereof beyond.	
Switched subscribers	62½

Subscribers will be billed at a gross rate for the principal classes of service, 25 cents in excess of the net rate. The net rate will be applicable for all bills paid promptly in accordance with the company's standard rules.

This exchange was formerly owned and operated by the Tri-State Telephone & Telegraph Co., of St. Paul, Minn., but upon the division of properties by the Tri-State and Northwestern Bell companies, the exchange was acquired by the latter. It was later transferred by the Northwestern Bell to the Wisconsin Telephone Co. for a consideration of $8,415.

Since acquiring the Grantsburg exchange, the Wisconsin company has rebuilt the plant, bringing the total investment up to $16,944, as of December 31, 1923. This figure was used by the commission in determining the reasonableness of the rate increase proposed by the company in this case.

Summary of Commission Rulings And Schedules of Hearings.

ALABAMA.

July 24. Permission granted the Demopolis Telephone Co., to discontinue its telephone service to Linden, the county seat of Marengo County. The commission's order recited that the interest of public welfare did not require a continuation of the service.

IDAHO.

July 3: The Mountain States Telephone & Telegraph Co., authorized to abandon its telephone exchange at Bellevue, provided it connects to and serves through the Hailey exchange all subscribers who are now being, or who would hereafter be served through the Bellevue exchange.

ILLINOIS.

July 23: Joint application filed, asking for authority for the Rock River Co. of Rochelle, of which G. W. Hamlin is president, to purchase the property of the Forreston Mutual Telephone Co. of Forreston, of which Hiram Rewall is the president. The Rock River Telephone Co. also asked for authority to establish five-cent toll charge between Forreston and Mount Morris and between Forreston and Oregon and a ten-cent toll charge between Forreston and all other exchanges of the Rock River Telephone Co.

INDIANA.

June 27: Spiceland Telephone Co. authorized to place in effect an increased schedule of rates and to set aside for depreciation 5 per cent of $23,000.

KANSAS.

July 3: Consolidated Telephone Co. authorized to increased rates at its Scott City exchange, effective August 1.

July 3: Consolidated Telephone Co. authorized to increase rates at its Blue Rapids exchange, effective August 1.

July 3: Consolidated Telephone Co. allowed to place in effect an increased schedule of rates at its Norton exchange, effective August 1.

NEBRASKA.

July 26: Complaint filed by the Hardy Telephone Co., against the Lincoln Telephone & Telegraph Co., alleging improper distribution of tolls.

July 26: Complaint filed by A. W. Dorland, of Fairbury, against Lincoln Telephone & Telegraph Co., alleging collection of excess rentals.

July 28: In the matter of the request of T. P. Hamilton, owner of a 30-mile line running from Thedford to Brownlee, for permission to increase rental charges to six subscribers using the line from $1 a month to $1.25; found that situation warrants the increase and it is authorized, the 25 cents a month extra being paid to Brownlee for handling calls there; application for establishment of 25-cent toll charge for messages from Thedford to Brownlee to Thedford granted, and charge authorized.

July 29: Complaint filed by A. C. Lake, of Maxwell, against the Curtis and Fix Creek Telephone companies alleging discontinuance of service without just cause.

July 29: Application of the Farmers Telephone Co., of Newcastle, for permission to increase rates, granted and authority issued to charge schedules as fixed by commission.

NEW YORK.

August 1: Application filed asking for approval of the purchase by the Delaware & Walton Telephone Co., of Walton, of the property and franchise of the Walton People's Telephone Co. of Walton, and the Downsville Telephone Co. of Downsville. Possession was to have been given January 1, and it is asked that the transfer be treated as of that date.

August 5: Hearing at Albany in the matter of the failure of the Nicholville Home Telephone Co. to complete and correct its report for the year ended December 31, 1923.

August 6: Hearing at New York on complaint of the New York Telephone Co., against the maximum rates, charges and rentals for telephone service fixed by the orders of the commission in cases Nos. 377 and 7720, dated January 25, 1923.

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OHIO.

July 28: The Bergholz Telephone Co., filed application for authority to issue at 95, $58,000 first mortgage, 6 per cent bonds, the proceeds to be used to pay $18,000 matured bonds which are outstanding, and to finance a $40,000 budget of adddditions and improvements.

July 30: The commission approved and filed a surety bond for $21,000 which the Ohio Bell Telephone Co. offered to put into effect, upon expiration of the period of suspension, its increased rates for Steubenville.

July 30: The city of Cincinnati filed application for holding a hearing upon the decision of the commission with respect to the new rates of the Cincinnati & Suburban Bell Telephone Co. The city contends that the commission, in addition to deciding the case against the law and weight of evidence, and in permitting the introduction of objectionable matter presented by the company, and excluding proper matter offered by the city, has erred in allowing the company depreciation charges against, and a return upon, property provided from both the investment of the depreciation reserve and the corporate surplus. The commission promptly overruled the application.

August 1: The commission approved the reorganization of the Elyria Telephone Co., by (a) authorizing the sale of all the property of the present company, subject to bond indebtedness of $50,000 to a new company of the same name for $850,000; and (b) authorizing the new company to issue in payment of the property $700,000 common stock and $150,000 7 per cent preferred .

August 2: The Wood County Telephone Co., elected to put into effect its suspended increased rates for Bowling Green and North Baltimore, filed on June 1, when the period of suspension expires, and advised that the proposed new rates will increase gross revenues per year in Bowling Green $13,518, and in North Baltimore $4,389. On the showing the commission directed the company to give surety bonds for North Baltimore in the sum of $2,500 and Bowling Green $7,000. Such bonds were immediately produced and approved and filed.

OKLAHOMA.

August 8: Hearing on case of M. K. & T. R. R., and Western Union Telegraph Co. vs. Craig County Telephone Co., alleging violation of order No. 1946; also case of M. K. & T. R. R. and Western Union Telegraph Co. vs. Adair Telephone Co., alleging violation of the same order.

August 13: Hearing in case of Maramec Telephone Co. vs. Jennings Telephone Co., alleging invasion of territory.

OREGON.

July 25: The Pacific Telephone & Telegraph Co. filed a report showing that connection agreements have been made with the Aurora Mutual Telephone Co., and the Home Independent Telephone Co. of La Grande. Under the agreement patrons of the Home Independent company and the Aurora Mutual company will be provided with long distance service over the lines of the Pacific corporation.

PENNSYLVANIA.

July 22: The Bell Telephone Co., of Pennsylvania directed to modify its tariff schedules under the terms of the agreement reached at the conference between counsel for the 38 complaining municipalities, corporations and individuals and the company on July 8. The adjusted rates will set aside most of the schedules which have been effective since May 1 and will save the telephone consumers of the state approximately $570,000 a year.

The complaints are dismissed without prejudice to any rights of the complainants which will be guarded by the commission in any proceedings that may be found necessary where purely local conditions have not been met by the general adjustment.

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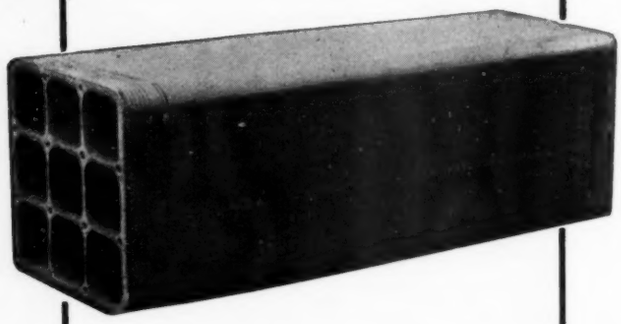

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The famous Lavier formula—a different method for making batteries—has just been applied to radio batteries by the Jordan Battery Co., Ypsilanti, Mich., manufacturers of the famous Ray batteries. This battery is called the Ray-dio B storage battery and is said to be a revolution in radio battery construction.

Among the many unusual features of this battery is the fact that no separators are used, giving free, unobstructed passage of the current. Ray-dio B storage batteries, it is stated, respond instantly to atmospheric variations, thus eliminating the annoyance of constant tuning.

They are easily and quickly rechargeable and a small amount of current from the electric light circuit keeps them fully charged all the time, doing away with the annoyance of using batteries after they have been partly discharged.

Because of the lower manufacturing costs made possible by the Lavier formula, the prices, too, are considerably lower than they would otherwise be.

Stowger Exhibit at British Exposition Showing Model Switching Units for London Area.

Strowger Automatic Director at British Empire Exhibition.

The opening of the British Empire Exhibition at Wembley coincides with the beginning of the Strowger automatic telephone era for London, installation of the new Strowger system in that city having just begun.

As was announced in these columns some months ago, the British post office, after fully investigating the possibilities of the Strowger system for London, decided to adopt this equipment for the whole of the London area, and placed orders with the Automatic Telephone Mfg. Co., Ltd., Liverpool, the British licensees for the Strowger system, for the large initial installation.

The adaptation of the Strowger system to the peculiarities of the London telephone network involves such unusual engineering features that arrangements were made jointly by the British post office and the Automatic Telephone Mfg. Co., Ltd., to exhibit complete models of the London installation so that visitors to the exhibition could see for themselves the method to be employed in handling telephone traffic in London when the "transition period" commences. The demonstration equipment is so constructed that telephone engineers visiting the exhibition can obtain a very convincing demonstration of the engineering features of the Strowger automatic director system.

Another View of Strowger Automatic Exhibit Presenting a Contrast.

The exhibit shown in the accompanying illustration represents two main automatic exchanges, Richmond and City; one automatic satellite office, Petersham; one manual section with automatic equipment to represent a mechanical tandem exchange, and one manual section represent-

Demonstration Exhibit; Even Dialing and Removing of Receiver Is Done Automatically.

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ing A and B positions in a typical common battery manual office (Dalston), the B position being equipped with call indicator apparatus.

Both the City and Richmond units are fitted with directors, first code selectors, first group selectors, second group selectors and connectors, while there are also incoming selectors and repeaters for the trunks from and to the mechanical tandem exchange.

The Petersham unit is fitted with switching selector repeaters, digit-absorbing selectors and final selectors together with two-way second group selectors and outgoing secondary line switches for trunks to Richmond.

The following types of calls can be demonstrated on the exhibit:

1. Automatic to automatic:
(a) Main office to other main office.
(b) Main office, local.
(c) Main office to satellite.
(d) Satellite to main office.
(e) Satellite, local.
2. Automatic to manual.
3. Manual to automatic.

Another illustration shows one end of the booth at which is placed a working model, demonstrating the necessary processes to be followed in setting up a call on Strowger equipment. It consists of two wall sets, two rotary line switches with line and cut-off relays, two group selectors, and one connector.

At each end of the model, a pair of life size wax hands is mounted, and by means of a motor-driven camshaft, hidden from sight, the hands in turn go through the operations of removing the receiver from the hook and then dialing.

The two operations control the chain of switches in exactly the same way as if the control was effected by human hands, and the bell at the called telephone is rung from the final selector in a standard manner.

As the call is extended from the line switch to the group selector and from this to the connector, shutters on which arrows are painted, become visible and indicate the progress of the call. After ringing, the receiver at the called telephone is removed, and shortly afterwards both receivers are replaced, when all switches release. In a short time a call is set up in the reverse direction.

When the model is working, it attracts, by its novelty, large crowds to the booth. Four calling dials, accessible to the public, are placed below the window. The booth itself is of tasteful design, carried out in blue and gold and well lighted by inverted lamps.

Large Consumption of Lead by Telephone Companies.

Consumption of lead by the telephone companies in the United States reaches an astounding amount according to a recent statement issued by the Naitonal Lead Co., New York.

According to the statement there are about 76,000,000 fuses in the telephone systems of the country, all containing lead. Every telephone line has in addition to a fuse a protector. Small particles of lead in these, which are both in the exchange and at the subscriber's end of the wire, melt when lightning strikes the line, diverting it to ground.

Lead in fuses is only one of many uses to which this metal is put in the telephone system. In the telephone instrument and box is an average of 51 soldered connections. Lead is in all of them.

Exchanges in the United States and telephone lines running out of them have billions of soldered connections, with a total of about 322,000,000 pounds of lead in them. Changes in connections require the use of about 70,000,000 more pounds of lead annually.

One telephone company uses in a year more than 53,000,000 pounds of lead to cover 35,300,000 feet of cable. Today there are in America about 82,000 miles of telephone, telegraph, radio and electric light cable covered with 327,300,000 pounds of lead, and along this cable are more than 6,000,000 pounds of lead for connecting and sealing the ends of cable to keep out moisture and for terminal boxes.

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Consulting Engineer
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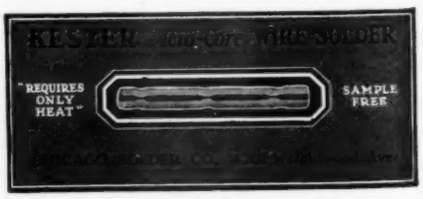

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